SPETEC®

ORIGINAL OPERATING & INSTALLATION INSTRUCTIONS

Precision Syringe

Store for future use!

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Product Changes

Year	Type	Changes

Revisions to the document

Date	Version	Changes
07.04.2025	2.0	New format, software extracted

Permits

This document requires the following permits:

Name	Title

Content

Table of figures

1 Introduction

These Original Operating & Installation Instructions provides you with all the information you need for the smooth operation of the Syringe pump (hereinafter also machine).

The Original Operating & Installation Instructions must be read, understood and applied by all persons involved in the assembly/installation, transport, commissioning, operation, maintenance, cleaning, troubleshooting, decommissioning, dismantling and disposal of the machine . This applies in particular to the safety instructions listed.

After studying the Original Operating & Installation Instructions you can:

- the Syringe pump transport in a safe manner,
- the Syringe pump Assemble/install in a safety-compliant manner,
- the Syringe pump put into operation in a safe manner,
- the Syringe pump operate and operate in a safety-compliant manner,
- take the appropriate action in the event of a malfunction,
- the Syringe pump wait according to the regulations,
- the Syringe pump clean in accordance with the regulations,
- the Syringe pump decommission in a safe manner,
- the Syringe pump dismantle in a safe manner,
- the Syringe pump Dispose of in accordance with the regulations.

In addition to the Original Operating & Installation Instructions general, statutory and other binding regulations for accident prevention and environmental protection in the country of use must be observed.

The Original Operating & Installation Instructions is constantly at the scene of the Syringe pump keep.

1.1 Means of presentation

As an indication and as a direct warning of dangers, special attention should be paid to the following texts:statements in this Original Operating & Installation Instructions as follows:

1.1.1 Sectional warnings

Section warnings apply not only to a specific action, but to all actions within a section.

Construction

⚠ SIGNAL WORD

Symbol for further explanation of the danger

Nature and source of danger!

Possible consequence(s) in case of non-compliance!

► Measure(s) to avoid the danger.

Danger levels

⚠ DANGER

Hazard with a high degree of risk which, if not avoided, will result in death or serious bodily injury.

⚠ WARNING

Medium-risk hazard which, if not avoided, may result in death or serious bodily injury.

⚠ CAUTION

Low-risk hazard which, if not avoided, may result in minor or moderate bodily harm.

HINT

Hazard with a low degree of risk which, if not avoided, can result in damage to property.

1.1.2 Embedded warnings

Embedded warnings apply to specific actions and are directly integrated into the action.

Construction

⚠ SIGNAL WORD type and source of danger

Possible consequences of non-compliance

► Measures to avoid the danger

Danger levels

– **⚠ DANGER/WARNING/CAUTION**

– ***NOTE*** (without warning triangle)

1.1.3 Other means of presentation

The info icon provides useful information.

– Texts that follow this marking are bulleted lists.

► Texts that follow this marking describe measures in warnings and action steps.

a) Texts that follow this marking describe activities that are to be carried out in the given order.

„ “ Texts in quotation marks are references to other chapters or sections.

1.1.4 Symbols used in the Original Operating & Installation Instructions

In warnings, special hazards are also marked as follows:

Symbol	Description
	Warning sign
	**Warning of hand injuries** This symbol warns of hand injuries.
	**Warning of the danger of moving in** This symbol warns of pull-in hazards due to rotating components.
	**Warning of automatic start-up** This symbol warns of dangers due to automatic start-up.
	**Warning of the risk of cutting** This symbol warns of the dangers of cutting.
	**Warning of obstacles on the ground** This symbol warns of tripping hazards caused by obstacles on the ground.
	**Warning of the risk of slipping** This symbol warns of the dangers of slipping on the ground.

Symbol	Description
	**Suspended load warning** This symbol warns of dangers when staying under suspended loads.
	**Electrical voltage warning** This symbol warns of dangers caused by electrical voltage.
	**Hot surface warning** This symbol warns of the risk of burns from hot surfaces.
	Prohibition signs
	**Entry prohibited for unauthorized persons** This symbol prohibits unauthorized access to the danger area. Dangers cannot be detected by unauthorized persons.
	**machine may only be operated by one person** This symbol prohibits the operation of the machine by several people.
	**No access for people with pacemakers or implanted defibrillators** This symbol prohibits access for people with pacemakers or implanted defibrillators.
	**Reaching into it prohibited** This symbol prohibits touching.
	Mandatory signs
	**Original Operating & Installation Instructions heed** This symbol indicates the observance of the Original Operating & Installation Instructions there.
	**Unlock before maintenance or repair** This symbol indicates that all energy sources must be disconnected from the grid before cleaning, maintenance or repair.
	**Use safety goggles** This symbol indicates that safety goggles must be worn in the area of operation.
	**Use safety shoes** This symbol indicates that safety shoes must be worn in the area of operation.

Symbol	Description
	**Use handguards** This symbol indicates that hand protection must be worn in the area of operation.
	**Use protective work clothing** This symbol indicates that protective work clothing must be worn in the area of operation.
	**Use head protection** This symbol indicates that head protection must be worn in the area of operation.
Danger signs	
	**Warning of environmentally hazardous substances** This symbol warns of environmentally hazardous substances.
	**Danger - Beware of flammable substances** This symbol warns of flammable substances.
	**Hazard - Attention toxic (harmful to health)/Corrosive or irritating effect/Lower systemic health hazard** This symbol warns of substances that are harmful to health.
Other symbols	
	**Disposal Notice** This symbol indicates that the labelled product must not be disposed of with household waste.
	**Recycling** This symbol stands for the return of various materials to the recycling cycle.

1.2 Warranty and liability

The obligations agreed in the supply contract, the general terms and conditions of business and the terms of delivery of the Syringe pump and the legal regulations in force at the time of conclusion of the contract.

All information and notes in this Original Operating & Installation Instructions have been compiled taking into account the applicable standards and regulations, the state of the art and our many years of knowledge and experience.

These Original Operating & Installation Instructions is not intended to be a substitute for the suitability or reliability of the Syringe pump is intended for specific user applications and may not be used to determine their suitability or reliability.

The Syringe pump may only be used for the applications described by the manufacturer. All other applications are improper and are considered dangerous. The manufacturer cannot be held liable for any damage caused by errors, unintentional or improper use of the Syringe pump arise.

Warranty and liability claims for personal injury and property damage are excludedif they are attributable to one or more of the following causes:

- Improper or improper use of the Syringe pump,
- improper transport, assembly/installation, commissioning, operation, troubleshooting, maintenance/cleaning, decommissioning, dismantling and disposal of the Syringe pump,
- Failure to comply with the Original Operating & Installation Instructions as well as the information in the Original Operating & Installation Instructions with regard to installation, commissioning, operation, maintenance and cleaning of the Syringe pump,
- Use of unqualified or untrained personnel,
- structural changes to the Syringe pump (Modifications or other changes to the machine may not be allowed without the prior written permission of the Spetec GmbH . In the event of violations, the Syringe pump their suitability.),
- improperly carried out repairs,
- Use of non-approved spare parts or spare parts that do not meet the technical requirements,
- Catastrophes, foreign objects and force majeure.

In addition, Spetec GmbH reserves the right to revise this publication at any time due to technical changes in the context of improving the performance characteristics and further development, without the obligation to inform other persons about the revision.

1.3 Copyright

These Original Operating & Installation Instructions is protected by copyright and is intended exclusively for internal purposes.

Provision of the Original Operating & Installation Instructions to third parties, reproductions in any kind and form - even in excerpts - as well as exploitation and/or communication of the content are prohibited without the written permission of the Spetec GmbH except for internal purposes.

Violations oblige you to pay damages. Further claims are reserved.

1.4 Warranty

The warranty provisions are set out in the General Terms and Conditions of the Spetec GmbH contain.

1.5 Service/Customer Service

For technical information, please contact our customer service:

Telephone: +49 8122 95909-0

In addition, our employees are constantly interested in new information and experiences that come from the application and can be valuable for the improvement of our products.

2 Safety

⚠ WARNING

Failure to follow the following safety instructions can have serious consequences:

Hazard to persons from electrical, mechanical or chemical influences, failure of important machinefunctions and environmental damage!

- ► Read the safety and hazard warnings listed in this section thoroughly before operating the Syringe pump .
- ► In addition to the information in this Original Operating & Installation Instructions also observe the generally applicable safety and accident prevention regulations.
- ► In addition to the information in this Original Operating & Installation Instructions, please observe the existing national working, operating and safety regulations. Also comply with existing internal factory regulations.
- ► In addition to the instructions in the Original Operating & Installation Instructions also note the third-party documentation supplied.

2.1 Intended use

The operational safety of the Syringe pump is only guaranteed if it is used as intended.

The syringe pumps are designed exclusively for dosing and conveying various liquid media with high precision and minimal pulsation.

The Syringe pump is standard for operation by one person and may only be installed, put into operation and operated by specialist personnel who are familiar, trained and instructed with the safety regulations.

The Syringe pump is for the Automatic mode, semi-automatic mode, set-up mode, manual mode and remote mode envisaged.

The Syringe pump may only be used within the scope of its technical data. The intended use also includes compliance with the specifications of the technical data, compliance with the Original Operating & Installation Instructions as well as compliance with maintenance and repair regulations and compliance with nationally applicable safety, occupational health and safety and accident prevention regulations. Any operation beyond this is considered not to be in accordance with its intended purpose.

Customer-side equipment must comply with the mechanical, thermal and life-related stresses that occur.

The specified maximum technological data must not be exceeded. The area of application of the Syringe pump is the area of industry inside buildings (never use outdoors). For use other than that listed here, the Syringe pump and is considered improper use. In particular, it is prohibited to:

- use defective or unsuitable accessories,
- the Syringe pump while uninstructed persons are in the danger area,
- the Syringe pump in explosive atmospheres, such as when flammable liquids, gases or dust are present. The equipment generates sparks that can ignite the dust or fumes,
- the Syringe pump operate in the vicinity of flammable substances or components,
- the Syringe pump as a safety-related component or for the assumption of safety-relevant functions,
- the Syringe pump if it is not ready for operation or has been modified,
- the Syringe pump for cosmetic, pharmaceutical or food purposes,
- the Syringe pump without instruction,
- Items inside or on the Syringe pump . Remove any items that are inside or on the Syringe pump condition
- the equipment of the Syringe pump Exposed to rain or wet conditions. water that is used in the equipment of the Syringe pump increases the risk of electric shock.

The intended use also includes:

- Observing all instructions from the Original Operating & Installation Instructions and third-party documentation,
- compliance with inspection and maintenance intervals,
- the use of operating materials and auxiliary materials in accordance with applicable safety regulations,
- compliance with state, regional and local safety and accident prevention regulations,
- compliance with operating conditions,

The technical specifications stated in the technical data must be complied with without exception.

► Use the Syringe pump only in accordance with the intended purpose, otherwise no safe operation is guaranteed.

► If you have any specific questions, please take advantage of the support of Spetec.

For all personal injury and property damage resulting from improper use, it is not the manufacturer, but the operator of the Syringe pump responsible!

2.1.1 Structural changes to the Syringe pump

Design and manufacturer acceptance are carried out on the basis of the Product Safety Act (ProdSG). Without the prior written permission of the Spetec GmbH no changes, additions or alterations may be made to the Syringe pump .

In the event of non-compliance, the Syringe pump their suitability. The manufacturer of the Syringe pump is outside the warranty.

Replace components that are not in perfect condition immediately.

Use only genuine spare parts/wear parts/accessories. These parts are specially designed for the Syringe pump Designed. In the case of externally sourced parts, there is no guarantee that they are designed and manufactured in accordance with stress and safety.

parts and optional equipment that are not manufactured by the Spetec GmbH are not intended for use on the Syringe pump released.

2.1.2 Foreseeable misuse

Any use of the Syringe pump can lead to serious injuries.

- ► Use the Syringe pump only as intended.
- ► Use the Syringe pump only when properly performed maintenance and inspection.
- ► Use only media that is compatible with the pump's syringe material. Conveying unapproved media can cause damage to the syringe and malfunction of the pump.
- ► Only use syringes that are compatible with the pump. The use of unapproved syringes may cause damage or malfunction of the pumps.
- ► Avoid using the pump in hazardous areas unless it is specifically designed for this purpose. Improper use in such environments can lead to dangerous situations.
- ► Do not make any modifications or manipulations to the pump. Impermissible modifications can impair operational safety.

2.2 Requirements for staff

The Syringe pump may only be transported, assembled, installed, commissioned, operated, maintained, cleaned, repaired, decommissioned, inspected, dismantled or disposed of by persons who are qualified and/or instructed to do so. If the personnel concerned do not already have the necessary knowledge and skills, appropriate training and instruction shall be ensured. All local regulations must be followed.

These persons must comply with the Original Operating & Installation Instructions and act accordingly. The respective powers of the staff must be clearly defined.

Persons with limited physical, sensory or mental abilities or lack of experience and knowledge must be supervised or instructed in the safe use of the Syringe pump and understand the dangers involved.

In the Original Operating & Installation Instructions the following qualifications are named for different areas of activity:

2.2.1 Personnel to be trained

Personnel to be trained, such as trainees or temporary staff, are not aware of all the dangers that arise during the operation of the Syringe pump can occur. Work on the Syringe pump only under the supervision of qualified or instructed personnel.

2.2.2 Instructed staff

Instructed personnel were instructed by the operator or qualified personnel about the tasks assigned to them and possible dangers in the event of improper behavior.

2.2.3 Qualified personnel

Qualified personnel are able to carry out the work assigned to them and to independently identify and avoid possible hazards due to their professional training, knowledge and experience as well as knowledge of the relevant regulations.

2.2.4 Qualified electrician

Due to his or her professional training, knowledge and experience, as well as knowledge of the relevant standards and regulations, a qualified electrician is able to carry out work on electrical equipment and to independently identify and avoid possible hazards.

The electrician is trained for the specific location in which he or she works and is familiar with the relevant standards and regulations.

2.2.5 Responsibilities

Improper handling can lead to considerable personal injury and property damage.

- Only people who can be expected to perform their work reliably are allowed as staff. No persons are allowed to participate in the Syringe pump whose ability to react is impaired by drugs, alcohol, medication or the like.
- All persons participating in the Syringe pump work, the Original Operating & Installation Instructions and confirm by their signature that they have understood them.
- Personnel to be trained may initially only be trained under the supervision of qualified personnel at the Syringe pump work. The completed and successful instruction must be confirmed in writing.

► Observe the personnel requirements for the different phases of life/operating modes.

Personnel requirements	Life phase/mode of operation
Qualified Specialists, Electricians	Transport, assembly, commissioning, malfunction, maintenance, decommissioning, dismantling, disposal
Personnel to be trained, instructed personnel	Normal operation and cleaning

The operator is responsible for instructing the staff.

2.2.6 Obligation of the staff

All persons involved in work on the Syringe pump before commencing their duties, they undertake:

- Observe the basic rules on occupational safety and accident prevention,
- the safety instructions and the warnings of these Original Operating & Installation Instructions and to confirm by signature that they have understood it.

2.2.7 Meddler

Unauthorized persons who do not meet the qualification requirements for personnel are not aware of the dangers in the area of operation.

- ► Keep unauthorized persons away from the area of operation.
- ► If in doubt, talk to people and assign them out of the area of operation.
- ► Interrupt work as long as unauthorised persons are in the area of operation.

2.3 Basic safety instructions

- ► The Syringe pump may only be put into operation and maintainedOriginal Operating & Installation Instructionsoriginal operating and assembly instructions.
- ► Use the Syringe pump only according to the intended purpose.
- ► Operate the Syringe pump only if there are no other persons in the danger area.
- ► When operating the Syringe pump any way of working that enhances the safety of persons or Syringe pump affected.
- ► Keep the application range of the Syringe pump always clean and tidy to avoid hazards from dirt and parts lying around.
- ► Operate the Syringe pump only within the scope of their technical performance data.
- ► Keep all safety and hazard warnings on the Syringe pump in a readable condition and renew it if necessary.
- ► The operation and work on the Syringe pump may only be carried out by qualified or instructed personnel.
- ► In case of malfunctions, set the Syringe pump immediately out of service. Allow faults to be detected by appropriately trained specialists or by the Spetec GmbH remove.
- ► Preserve the Original Operating & Installation Instructions constantly at the place of operation of the Syringe pump on. It must be ensured that all persons carrying out activities at the Syringe pump which Original Operating & Installation Instructions at any time.

2.4 Environmental safety measures

► Comply with the regulations for waste prevention and proper waste recycling or disposal during all work.

Particularly during assembly and maintenance work as well as during decommissioning, care must be taken to ensure that substances hazardous to groundwater such as Lubricants, cleaning fluids and other chemical substances or emissions do not pollute the soil or get into the sewer system. These substances must be collected, stored, transported and disposed of in accordance with state law in suitable containers.

2.5 Special hazard statements/residual hazards

2.5.1 Symbols used on the machine

Symbol	Description	Place of installation
	Warning sign	
	**Electrical voltage warning** This symbol warns of dangers caused by electrical voltage.	All enclosures containing electrical equipment
	Mandatory signs	
	**Original Operating & Installation Instructions heed** This symbol indicates the observance of the Original Operating & Installation Instructions there.	On the nameplate
	Other symbols	
	**Disposal Notice** This symbol indicates that the labelled product must not be disposed of with household waste.	On the nameplate

► Keep all safety and hazard warnings on the Syringe pump in a readable condition. Renew the notes if necessary.

2.5.2 Dangers of electrical energy

⚠ DANGER

When touching live parts, there is a risk of electric shock!

Failure to do so will result in serious injuries!

- ► Keep electrical components closed at all times.
- ► Only have work on electrical equipment carried out by a qualified electrician who is specially trained to work on electrical equipment and can identify and avoid hazards.
- ► Apply the Five Safety Rules:
  1. Unlock.
  2. Secure against reconnection.
  3. Determine the absence of tension.
  4. Grounding and short-circuiting.
  5. Cover or fence off live parts.

⚠ DANGER

In the event of electric shock, there is a risk of secondary accidents due to frightening (e.g. falling)!

Failure to do so will result in serious injuries!

- ► Apply the five safety rules when working on electrical equipment.
- ► Only have work on the electrical equipment carried out by a qualified electrician.

- ► Before working on the electrical equipment, switch off the Syringe pump de-energized and secure it against restarting.
- ► Only have work on the electrical equipment carried out by a responsible electrician - e.g. company electrician.
- ► Check the electrical equipment regularly for defects such as loose connections or scorched cables. Have defects eliminated immediately.
- ► Have the electrical equipment and stationary electrical equipment checked by a qualified electrician at least every 4 years. Stationary electrical equipment is fixed equipment or equipment that does not have a carrying device and whose mass is so large that it cannot be easily moved. This also includes electrical equipment that is temporarily permanently attached and operated via movable connection cables.
- ► Have portable electrical equipment, connecting cables with plugs and extension and extension cables machineInspect connection cables with their plug and plug devices, if they are used, at least every 6 months by a qualified electrician.
- ► Equipment is mobile if it can be moved under tension due to its type and usual use.
- ► Changes to electrical equipment carried out after the test must comply with the currently valid standards and guidelines.
- ► Check all safety equipment of the Syringe pump regularly on their function.

- ► Keep all enclosures containing electrical equipment closed at all times.
- ► Have repairs carried out exclusively by Spetec GmbH .
- ► In the case of leakage currents above 10 mA, additional measures must be taken (earthing).
- ► Regularly check the electrical equipment of the Syringe pump.
- ► Instantly eliminate loose connections and defective cables.
- ► When working on the Syringe pump off the mains voltage and secure it against reconnection.
- ► Note that it is possible to be influenced by electromagnetic radiation, e.g. in connection with the control of control devices. If inadmissible radiation levels occur in the installed state, take appropriate shielding measures before placing them on the market.

2.5.3 Dangers of media escaping under pressure

⚠ CAUTION

Liquids escaping under pressure can penetrate the skin!

Failure to do so can result in injuries!

- ► Only have specialist personnel with special knowledge and experience carry out work on the components.
- ► Before working on the components, turn off the machine and secure it against restarting.
- ► Depressurize openable system sections and syringes before starting repair work.
- ► Check all syringes and fittings regularly for leaks and for noticeable damage. Have damage repaired immediately.
- ► Replace syringes at appropriate intervals, even if no safety-relevant defects are recognizable.
- ► Always wear the protective equipment necessary for the respective work (protective clothing, protective gloves) while working.

2.5.4 Dangers from purchased components

⚠ CAUTION

At the Syringe pump there are dangers due to purchased components!

Failure to follow the manufacturer's operating or assembly instructions of the suppliers can result in injuries!

► Note the structure, function and mode of action of the purchased components, which are described in detail in external manufacturer's operating or assembly instructions. These are part of the technical documentation and are included with it. In particular, comply with the safety chapters and the maintenance and repair chapters. The operating or assembly instructions for the purchased parts can be found in the documentation folder that this Syringe pump is enclosed. Observe the manufacturer's operating or assembly instructions. Otherwise, personal injury or property damage may be the result.

2.5.5 Hazards from hot surfaces

⚠ WARNING

Contact with hot components can cause burns!

Failure to do so can result in serious injury!

► Always wear protective clothing and protective gloves when working near hot components. Components that can get hot are marked with the graphic symbol "Hot surface warning".

► Before maintenance or repair work, allow the components to cool to ambient temperature.

► Ensure adequate contact protection.

2.5.6 Dangers of tripping

⚠ CAUTION

Tripping hazard due to improperly laid energy supply lines!

Failure to do so can result in injuries!

► Always lay cables in the supply shaft in a trip-free and barrier-free manner.

► Colour-code unavoidable stumbling blocks.

2.5.7 Dangers of squeezing

CAUTION

Risk of injury due to crushing in the area of the syringe slide!

There may be slight bruising!

- ► Keep a sufficient distance from the area of application of the moving components.
- ► Do not grab moving parts.
- ► Keep your hands out of the area of the syringe slide, especially during operation.
- ► Note that the theoretically maximum possible force of the stepper motor is below the permitted 75 N and intervention in hazardous areas is not necessary in automatic mode.
- ► Make sure to correctly assess the movements of the syringe slide and keep a sufficient safety distance to be able to react in time.

2.5.8 Dangers due to suspended loads

WARNING

During the lifting process of the Syringe pump or the components, the following special hazards are to be expected:

Suspended loads can fall down, then there is a danger to life!

In the event of unsecured transport, there is a risk of tipping over!

Protruding edges can lead to bruises or cuts!

- ► Use only approved load mounts.
- ► Always wear the personal protective equipment necessary for the work (protective clothing, protective gloves, safety helmet and safety shoes) while working.
- ► Make sure that you and other people are not under suspended loads.
- ► Observe the marked anchorage points (if any).

2.5.9 Dangers of slipping

CAUTION

Risk of slipping due to spilled lubricants or leaked liquids!

Failure to do so can result in injuries!

- ► Clean the floor immediately if it gets dirty.
- ► Dispose of the cleaning wipes in the collection containers/waste bins provided for this purpose.

2.5.10 Dangers of improper filing

⚠ CAUTION

Danger due to improper storage of objects!

Improper placement of objects inside or on the Syringe pump can lead to damage, malfunctions or total failure as well as impair safety!

► Note that it is forbidden to carry items inside or on the Syringe pump . Remove any items that are inside or on the Syringe pump condition.

2.5.11 Dangers of using the wrong spare parts

⚠ WARNING

Danger of using the wrong spare parts!

Incorrect or faulty spare parts can lead to damage, malfunctions or total failure as well as impair safety!

► Use only original spare parts.

► Obtain the spare parts via the Spetec GmbH. The necessary information on the spare parts can be found in the enclosed parts lists or in "1.5 Service/Customer Service“.

2.5.12 Danger from inadequate protective measures

⚠ WARNING

Dangers due to inadequate protective measures!

Failure to do so can result in serious injury!

► Note that the Syringe pump is a built-in component without function, the operator is responsible for the Syringe pump sufficiently.

2.5.13 Dangers of automatic start-up

⚠ WARNING

Dangers due to automatic start-up!

Failure to do so can result in serious injury!

► Keep a sufficient safety distance.

► Before carrying out any manual work on the machine , make sure that it has been switched off and disconnected from the supply power.

2.5.14 Dangers due to the pull-in of rotating components

⚠ CAUTION

At the machine there are risks of moving in!

Failure to do so can result in minor injuries!

- ► Keep a safe distance.
- ► During setup, maintenance and repair work, pay attention to all moving components.
- ► Wear tight-fitting clothing in the danger area (no chains, rings, ties, etc.).
- ► In areas with pull-in hazards, only work without protective gloves (risk of catching or pulling in).
- ► For long hair, wear a hairnet to protect the hair from being pulled into rotating components.
- ► Do not grab moving parts.
- ► Secure the Syringe pump against touching. Before working on the system/machine, wait until all parts are at a standstill.
- ► Carry out adjustment and control activities only when the syringe pump is at a standstill.
- ► Always keep your hands away from rotating components during operation.

2.5.15 Dangers of insufficient qualifications

⚠ WARNING

Risk of injury in case of insufficient qualifications!

Improper handling of the Syringe pump can lead to considerable personal injury and property damage!

- ► Have all activities carried out only by qualified personnel.

2.5.16 Hazards from Lubricants, cleaning fluids and other chemical substances or emissions

⚠ WARNING

At the Syringe pump there are dangers from Lubricants, cleaning fluids and other chemical substances or emissions!

Failure to do so can result in serious injury!

- ► When handling, observe the safety regulations applicable to the product for Lubricants, cleaning fluids and other chemical substances or emissions.
- ► Always wear the protective equipment necessary for the respective work (respiratory protection, protective clothing, safety goggles and protective gloves) during work.

2.6 Personal protective equipment

In the operation of the Syringe pump personal protective equipment must be worn independently of the operational risk assessment in order to minimise health hazards. Personal protective equipment must be designed in particular with regard to the corresponding risk.

- ► Always wear the protective equipment necessary for the job while working.
- ► Do not wear rings, necklaces or other jewelry.
- ► Follow all instructions on personal protective equipment.

The symbols have the following meaning:

Symbol	Description
	**Safety shoes** Wear non-slip safety shoes to protect against heavy falling parts or slipping on slippery surfaces.
	**Protective work clothing** Protective workwear is tight-fitting workwear with low tear resistance, with tight sleeves and no protruding parts. It is mainly used to protect against detection by movable machinenteile.
	**Gloves** Wear protective gloves to protect your hands from friction, abrasions, punctures or deeper injuries, as well as from contact with hot surfaces or chemical substances.
	**Helmet** Wear a safety helmet to protect against falling or flying parts.

Symbol	Description
	**Goggles** Wear goggles to protect against high-pressure media leakage or flying parts.
	**Hearing protectors** Wear hearing protection to protect against hearing damage.
	**Hairnet** For long hair, wear a hairnet to protect the hair from being pulled into rotating components.

Personal protective equipment must be provided by the operator and must comply with the applicable requirements.

In addition, the national regulations as well as requirements from the operational area risk assessment and, if necessary, internal instructions of the operator must be observed.

2.7 Advice for emergencies

Preventive measures:

- ► Always be prepared for accidents or fire.
- ► Keep the first aid equipment (first aid kit, blankets, etc.) and fire extinguishing agents handy.
- ► Familiarize staff with accident reporting, first aid, fire extinguishing and rescue equipment.
- ► Keep access roads clear for emergency vehicles.

Measures in the event of accidents:

- ► Cut off the power supply to the Syringe pump.
- ► Rescue people from the danger zone.
- ► In the event of cardiac and/or respiratory arrest, initiate resuscitation immediately.
- ► In the event of personal injury, inform the first aid officer and an emergency doctor or rescue service.
- ► Clear the access roads for emergency vehicles. If necessary, assign someone to instruct the emergency services.
- ► Extinguish burning oil/grease with a CO2 extinguisher or powder extinguisher and a fire in the electrical control unit with a CO2 extinguisher.

2.8 Obligation of the operator

The Syringe pump is used in the commercial sector. The operator of the Syringe pump is therefore subject to the legal obligations for occupational safety.

In addition to the safety instructions in this Original Operating & Installation Instructions must be able to Syringe pump applicable safety, accident prevention and environmental protection regulations. In particular, the following applies:

- The operator must ensure that the Syringe pump is only used for its intended purpose.
- The operator must Original Operating & Installation Instructions always in legible condition and complete at the place of use of the Syringe pump .
- The operator must clearly regulate and define the responsibilities for installation, commissioning, operation, maintenance and cleaning.
- The operator may only use persons at the Syringe pump who have reached the legally permissible minimum age.
- The operator may only use sufficiently qualified and instructed personnel at the Syringe pump work.
- The operator must ensure that all persons associated with the Syringe pump that Original Operating & Installation Instructions have read and understood.
  In addition, he must demonstrably train the staff at regular intervals and inform them about the dangers.
- The operator must provide the staff with the personal protective equipment and ensure that it is used.
- The operator must ensure that only persons at the Syringe pump whose ability to react is not impaired by drugs, alcohol, medication or the like.
- The operator must ensure sufficient lighting in the area of operation of the Syringe pump worry.

Furthermore, the operator is responsible for ensuring that the Syringe pump is always in perfect technical condition. Therefore, the following applies:

- The operator must ensure that the Original Operating & Installation Instructions maintenance intervals described above.
- The operator must regularly check that all persons connected to the Syringe pump safety and warning notices are clearly legible and permanently attached to the Syringe pump remain.

3 Description of Syringe pump

All illustrations in this document are for general understanding and may differ from the actual execution.

3.1 Designation

The name of the pumps is made up of two parts:

Example:	**MP-SH-XE-XU**	**Precision Syringe**
	Abbreviation	Pump type

Legend Short name:

Example: MP-SH-EN-DU

Plate	Syringe holder	Encoder	Controller
MP	**SH**	**EN**	**DU**
MP = Mounting plate	SH = Standard holder	EN = with encoder	DU = with control unit
XP = without plate	UH = Universal holder	XE = without encoder	XU = without control unit

3.2 Description

The OEM syringe pumps are specially designed for installation in systems and are used for precise dosing and delivery of liquid media with minimal pulsation. The actual purpose of the pumps is to transport liquids between different points. In addition, they offer a wide range of benefits that go beyond the pure conveying function to meet the specific requirements of equipment manufacturers.

Main functions and areas of application:

Fluid delivery:

- Transport and dosing of liquids with high precision and stability.
- Minimization of pulsation for a constant flow rate.

Individualization:

- The pumps are manufactured as tailor-made OEM versions that can be optimally integrated into the design of the end device.
- The visual design of the pump components, such as the colour and shape of the base plate and other individual parts, is carried out according to the customer's wishes.

Easy integration:

- The pumps are designed for easy installation during final assembly, allowing for efficient integration with analyzers and other systems.

Economy:

- The use of modular basic components, which are manufactured in large quantities, ensures low costs while at the same time being adaptable to individual requirements.

Features:

- The pumps are characterized by their high precision in liquid dosing, which makes them ideal for applications in analytical technology and other areas where exact flow rates are required.
- Thanks to the variable design options, the pumps bear the "signature" of the device manufacturer and fit seamlessly into the design of the target system.

3.2.1 Pump type

3.2.1.1 Precision Syringe

Due to the small design and the syringe mounting points, the highest requirements in terms of variability and installation compatibility can be covered.

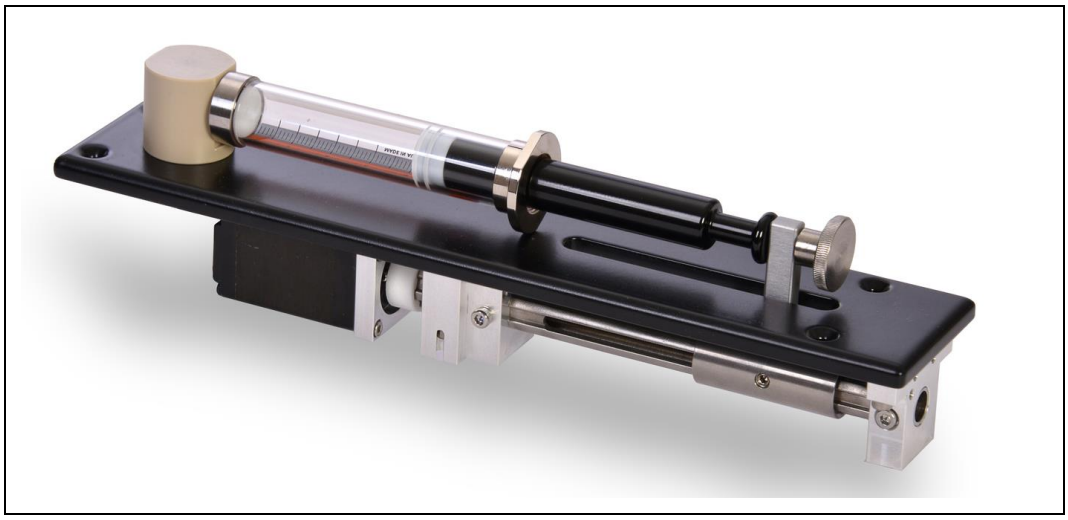


Illustration 1: Precision Standard

Precision Standard Functional Elements:

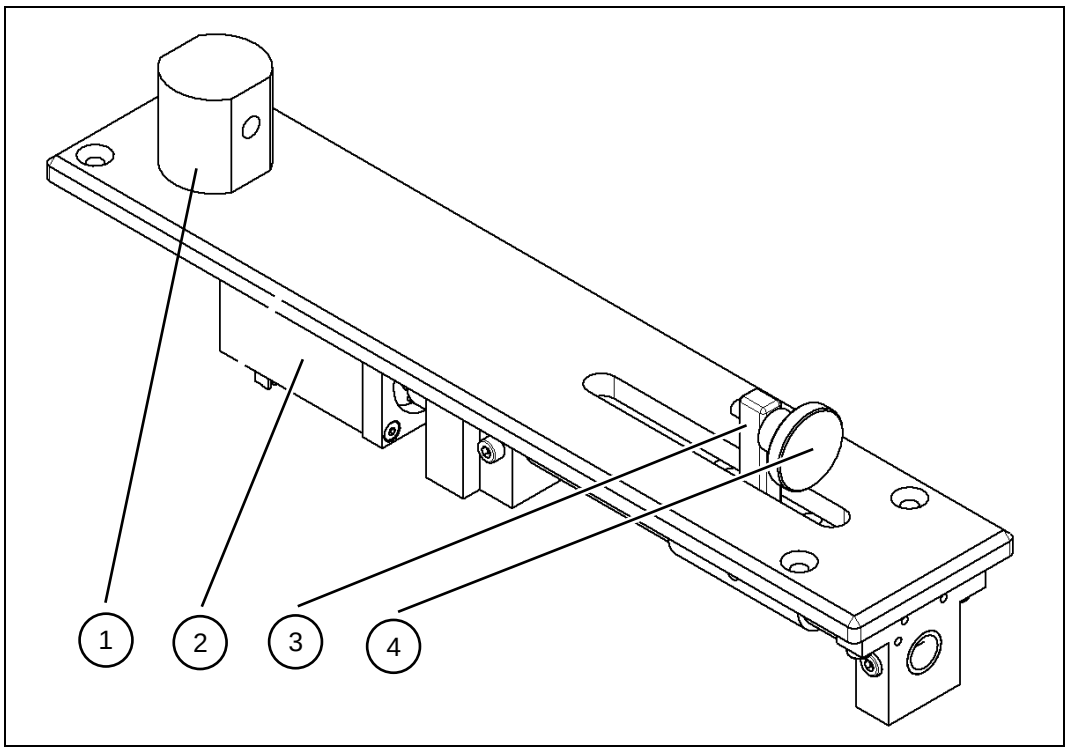


Illustration 2: Precision Standard Functional Elements

1	Syringe Holder	3	Syringe Slides
2	Stepper motor	4	Syringe attachment

3.2.2 Stepper motor control

3.2.2.1 SMC01

The optionally installed Spetec stepper motor controller SMC01 is a versatile control board for 2-phase stepper motors with a 1.8° step angle.

The SMC01 comes with Symax-Control operating software. This software includes the possibility of operating the Precision Syringe syringe pump in conjunction with the SMC01 stepper motor controller via PC. Please refer to the separate operating instructions for the Symax Controll software.

Alternatively, the control can also be controlled via the RS 485 / USB interface with external commands. Please refer to the separate operating instructions for external control of the SMC01.

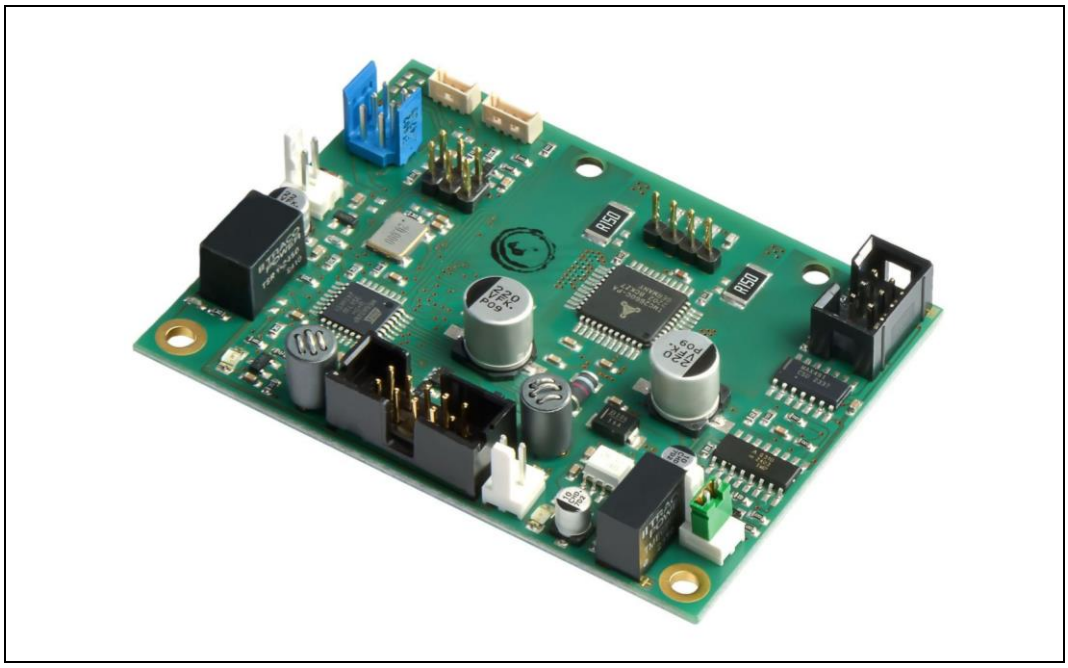


Illustration 3: Stepper motor controller SMC01

3.2.3 Syringe

When operating the syringe pumps, it is recommended to use glass syringes with a stroke of 60mm and a maximum volume of 10 ml. As standard, the syringe holder is equipped with a 1/4 inch – 28 UNF thread. The syringe attachment (plunger connection) is designed for a 6-32 UNC female connection as standard.

If you are unsure about the selection process, we strongly recommend that you Spetec GmbHSpetec GmbH.

3.2.4 Lifetime

3.2.4.1 Spline shaft

The spline shaft has a service life of 300,000 cycles if the maintenance intervals are observed. The cycle is defined as the movement of the syringe carriage from one end position to the other end position and back again.

3.2.4.2 Storage

The drivetrain is equipped with two ball bearings. The service life of the ball bearings is 20,000 operating hours at maximum load. In pump operation, the utilization rate is a maximum of 10%.

3.2.4.3 Stepper motor

The stepper motor has a service life of 20,000 operating hours at maximum load. In pump operation, the utilization rate is a maximum of 50%.

3.2.5 Nameplate

At each Syringe pump a nameplate is attached to record the key data in accordance with the Machinery Directive 2006/42/EC.

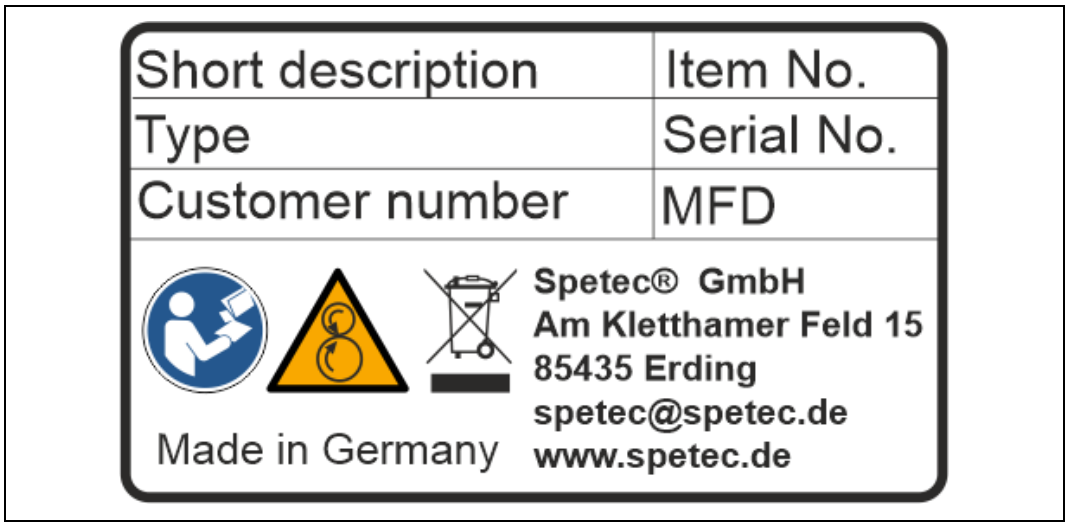


Illustration 4: Example nameplate Syringe pump

3.3 Modes

The operating modes of the Syringe pump are specified by the machine/system in which it is installed and are described in detail in the supplier's external manufacturer's operating or assembly instructions.

3.4 Specifications

► Note that the specifications refer to the standard version of the pump. The technical data of customer-specific pumps are Original Operating & Installation Instructionsoriginal operating and assembly manual.

3.4.1 Pump

3.4.1.1 Precision Syringe

Specifications - Precision Syringe	
Dimensions LxWxH	230 x 50 x 62 mm
Weight	600 g (without syringe)
Maximum Stroke	63 mm
Minimal feed rate	0.27nm/s
Maximum feed	1.37mm/s
Smallest step resolution	0.0273 µm per step
Thrust	75 N
Main Materials	Powder-coated aluminium, anodised aluminium, stainless steel, PEEK
Syringe Holder Tip	1/4 - 28 UNF thread
Syringe holder plunger	6 – 32 UNC threads
End position detection	Hall sensor (single-sided as reference point)
Temperature range	+10 to +50 °C
Humidity	20 to 80% (non-condensing)

3.4.2 Stepper motor control

► Note that the specifications refer to the standard version of the stepper motor controller. The technical data of customer-specific controllers are Original Operating & Installation Instructionsoriginal operating and assembly manual.

3.4.2.1 SMC01

Technical Data - Stepper Motor Controller SMC01	
Power supply	24 V
Power supply	1.65 A max.
Engine Emergency Stop Switch	Yes, via N.C. contact

3.4.3 Stepper motor

► Note that the specifications refer to the standard version of the stepper motor. The technical data of customer-specific stepper motors are Original Operating & Installation Instructionsoriginal operating and assembly manual.

Technical Data – Standard Pumps	
Voltage	4.5 VDC
Strom / Phase	0.67 A
Speed	0 - 250 rpm
Step angle	1,8 °

3.4.4 Dimensions

► Note that the dimensions refer to the Spetec standard versions of peristaltic pumps. The technical data of customer-specific peristaltic pumps are Original Operating & Installation Instructionsoriginal operating & assembly manual.

3.4.4.1 Dimensions Precision Syringe

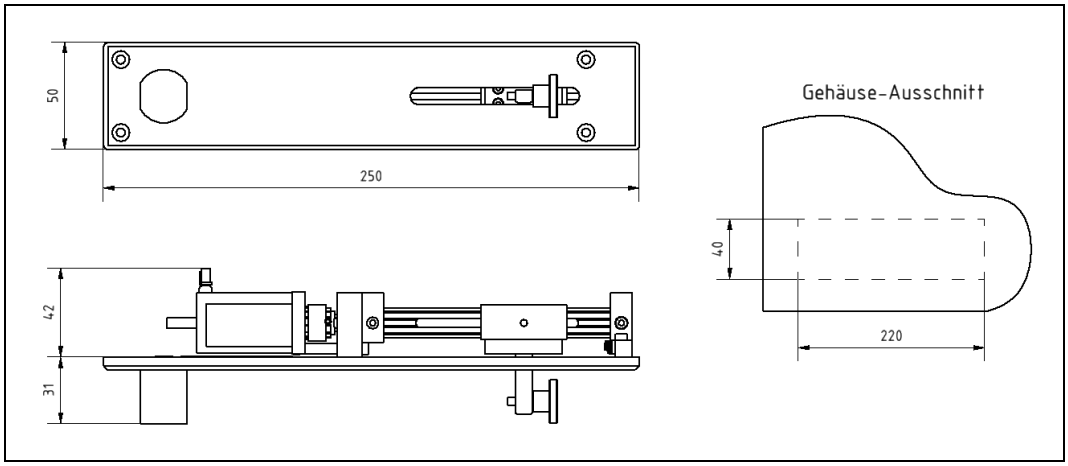


Illustration 5: Dimensions Precision Syringe

3.4.5 Airborne sound emissions below 70 dB(A)

A-weighted airborne noise emissions	< 70 Db
Information on the measurement method:	According to EN ISO 11204, EN ISO 3746

3.4.6 Intended service life

The intended service life of the Syringe pump taking into account the intended use and maintenance intervals, 10 years.

4 Transport and storage

4.1 Delivery by an authorized carrier

The machine is carried out by a Spetec GmbH authorized transport company to the customer.

► If the machine changes location, machineSpetec GmbHSpetec GmbH.

4.2 Control when the recipient takes over

Upon arrival of the Syringe pump at the customer's site, this must be examined for visible transport damage.

► Report transport damage immediately to the delivering office.

4.3 Packaging

One of the decisive factors for the type of packaging is the transport route. Unless separately contractually agreed, the packaging complies with the HPE packaging guidelines, which have been defined by the Federal Association of Wood Materials, Pallets, Export Packaging and the Association of German Engineering Institutes.

► Note the symbols on the packaging:

Examples of symbols on packaging:

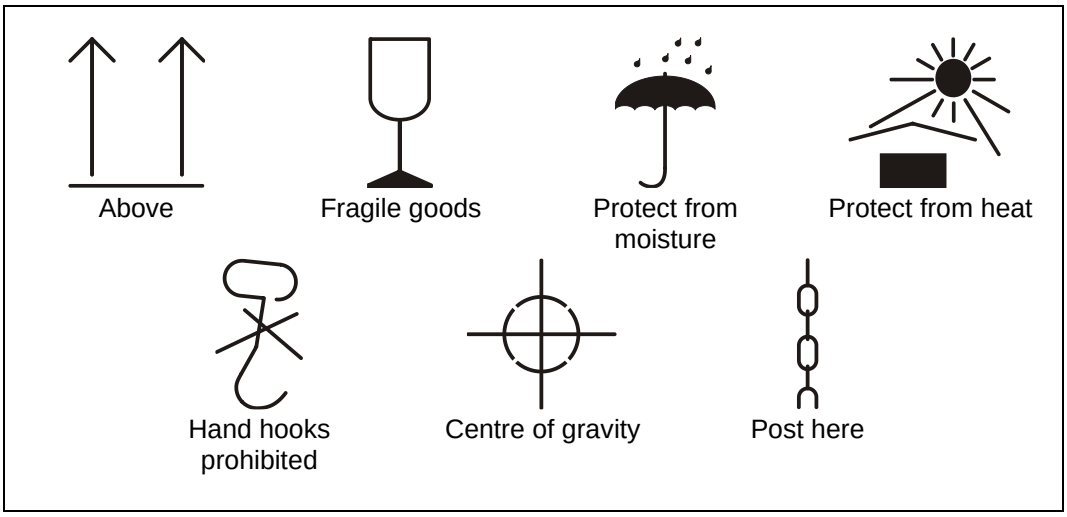


Illustration 6: Examples of pictorial symbols on packaging

4.3.1 Unwrap

When unboxing the Syringe pump as follows:

- ► Make sure anti-static measures have been taken.
- ► Remove the packaging. packaging materials such as foils, adhesive tapes and dispose of them properly.
- ► Carefully lift the device out of the packaging to avoid shocks at all costs.
- ► Wear safety shoes.
- ► Always remove all packaging before using the Syringe pump install.
- ► Keep the original packaging for re/onward transport or storage.
- ► Check the delivery for completeness based on your order.
- ► Be sure to keep the documents supplied, they contain important information on how to handle the Syringe pump.
- ► Check the contents of the package for visible damage in transit.
- ► If you notice transport damage or discrepancies between the contents of the packaging and your order, please inform the company. Spetec GmbH.

4.3.2 Repackaging

See chapter "4.3.1 Unwrap“.

4.4 Indications of hazards during transport

⚠ WARNING

When transporting the Syringe pump or its components, the following special hazards are to be expected:

Suspended loads can fall down, then there is a danger to life!

In the event of unsecured transport, there is a risk of tipping over!

Protruding edges can lead to bruises or cuts!

- ► Use only approved load mounts.
- ► Always wear the personal protective equipment necessary for the work (protective clothing, protective gloves, safety helmet and safety shoes) while working.
- ► Make sure that areas under suspended loads are always free of people.
- ► Observe the marked anchorage points (if any).

- ► Read also the chapter "2 Safety“.
- ► There Transport there Syringe pump or components may only be carried out by appropriately qualified and instructed personnel (forklift/crane drivers with a certificate of competence) and in compliance with all safety instructions.
- ► When choosing suitable lifting devices and load handling devices, always consider the weight of the heaviest component.
- ► Wear protective clothing, safety shoes, protective gloves and a safety helmet when working.
- ► Always secure the transport route with an additional person.
- ► Make sure that driveways and areas under suspended loads are always free of people.
- ► Do not use cables or attachments as attachment points. Transport eyelets on components (if available) are only used to lift the individual components, not to lift the entire assembly. Lift the Syringe pump or components only in the designated locations.
- ► Always lift the Syringe pump or components slowly and carefully to ensure stability and safety.
- ► Do not remove transport locks until the component has been finally attached to the job site.
- ► Transport the peristaltic pump only in its original packaging, antistatic.

4.5 Permissible aids for transport

Aids such as shackles, hooks or the like must be used according to the transport weight of the Syringe pump/components are selected and are only to be attached to the designated breakpoints.

- ► Avoid contact of the suspension chains or ropes with the Syringe pump or components. If this is not possible, take appropriate precautions to prevent damage to the Syringe pump or components.
- ► Adjust the length of the lifting equipment so that the Syringe pump or components can be transported horizontally.

4.6 Scope of delivery Syringe pump

The scope of delivery of the Syringe pump consists of the following components:

- Syringe pump
- Accessories (Optional, according to customer requirements)

4.6.1 Scope of delivery Original Operating & Installation Instructions

The scope of delivery of the Original Operating & Installation Instructions consists of the following documents:

- Original Operating & Installation Instructions
- Manufacturer's documentation of purchased components (if available)

4.7 Storage

If the Syringe pump not set up immediately after delivery, it must be carefully stored in a protected place. The Syringe pump must be stored temporarily in such a way that it is protected from cold, moisture, dirt, chemical and mechanical influences.

► Store the appliance in a dry and weather-protected place in its original packaging in a clean environment.

► Protect the device from environmental influences and dirt until final assembly.

► Note that the Syringe pump should be stored for a maximum of one year.

► The recommended storage conditions of the Syringe pump can be found in the chapter "Environmental Conditions".

In the event of improper storage, no liability is assumed for any damage caused!

► Please also note the storage conditions of the external manufacturer's operating or assembly instructions of the suppliers.

5 Assemble

Check the Syringe pump for damage before installation. In the event of visible damage, the Syringe pump cannot be installed and the manufacturer must be contacted.

5.1 Pre-assembly by Spetec GmbH

The Syringe pump is supported by the Spetec GmbH completely pre-assembled.

5.2 Indications of hazards during installation

WARNING

Risk of injury due to lifting the components at unintended anchorage points!

Failure to do so can result in serious injury!

- ► Lift the Syringe pump or components only at the designated attachment points (if any).
- ► Make sure that areas under suspended loads are always free of people.

CAUTION

Tripping hazard due to improperly laid energy supply lines!

Failure to do so can result in injuries!

- ► Always lay cables in the supply shaft in a trip-free and barrier-free manner.
- ► Colour-code unavoidable stumbling blocks.

CAUTION

Risk of injury due to unsuitable mounting material!

Unsuitable mounting material can subsequently lead to injuries during operation!

- ► If necessary, use only the included mounting material.

⚠ CAUTION

There is a risk of overexertion due to lifting heavy components!

Failure to do so can result in injuries!

► Always lift heavy components with several people or with the help of hoists.

► Observe the regional occupational health and safety regulations.

5.3 Preparatory measures

5.3.1 General

Before installing the Syringe pump it must be ensured that:

– additional lighting equipment (e.g. hand lamps) is available for installation (if necessary),

– the operating area is cleaned and dust-free at the place of use,

– necessary tools for assembly.

5.3.2 Preparatory measures Electrics

Before installing the Syringe pump it must be ensured that:

– connections are prepared for the power supply.

5.3.3 Preparatory measures for further supply energies

Before installing the Syringe pump it must be ensured that:

– Connections for which supply energies (liquids) are prepared.

5.4 Choice of location

5.4.1 Necessary operating and maintenance areas

- ► When choosing where to work, consider the environmental conditions.
- ► When choosing the place of use, consider the necessary operating and maintenance areas.

The operator must ensure sufficient lighting in the area of operation of the Syringe pump worry.

5.4.2 Requirements for the application area

⚠ WARNING

Risk of injury due to instability!

There is a risk of serious injury due to instability of the individual assemblies when assembling the Syringe pump due to incorrect assembly!

- ► Note that the betting area:
  - Planeben,
  - temperature-resistant, non-flammable and
  - vibration-free

  is.
- ► Have the assembly work carried out only by authorized and instructed personnel.
- ► Assemble the Syringe pump on an insert surface dimensioned for the weights and the loads that occur and fasten it.
- ► During installation, observe the tightening torques of all screw connections.
- ► Always wear the protective equipment necessary for the work at hand (such as protective clothing and safety shoes) while working.

⚠ WARNING

Risk of injury due to loss of load-bearing capacity!

A loss of load-bearing capacity can lead to considerable risks of injury!

- ► Check that the application surface has the necessary load-bearing capacity. The operator is responsible for the statics of the operational area. Observe the manufacturer's regulations on the area of application.

⚠ WARNING

Risk of injury due to lack of space!

There is a serious risk of injury such as scrapes, punctures or bone fractures as a result of the required components and/or parts being arranged too densely!

- ► Choose the location of the Syringe pump so that the required movement space of the personnel in the area of operation is not restricted or obstructed.
- ► Maintain the range of motion according to ergonomic guidelines and standards.
- ► Cordon off the danger area.
- ► Keep unauthorized persons away.
- ► Appoint a responsible person.
- ► Lay power supply lines and hoses in a trip-free and barrier-free way (e.g. under covers).
- ► Identify stumbling blocks.

- ► When choosing the place of use, consider the necessary operating and maintenance areas.

5.5 machinethe machine

5.5.1 Requirements for the place of use

The following requirements for the place of assignment must be observed:

- Make sure that the job site has sufficient load-bearing capacity.
- Use the Syringe pump in well-ventilated and ventilated rooms.
- Use the Syringe pump in adequately lit rooms.
- Protect the Syringe pump from direct sunlight and avoid a job site with heat-sensitive surfaces or near heaters, air conditioners or flammable materials.
- Avoid locations for the Syringe pump that are close to impermissible electromagnetic fields.
- Do not install the Syringe pump in places where there is a corrosive or explosive atmosphere.
- Note that the Syringe pump is for indoor use only.
- Do not use the Syringe pump in EX areas.
- Be aware of the environmental conditions.
- Note that the Syringe pump must be protected from the risk of accidental impacts. No use of vehicles (manual or electric pallet trucks, forklifts) in the vicinity of the Syringe pump.
- Note that the Syringe pump is intended for use in an industrial environment that is well lit, adequately ventilated, clean and dry.
- Allow sufficient space for repairs and escape routes.
- Please note that only persons familiar and trained with the safety regulations are required to participate in or with the safety regulations. Syringe pump are allowed to work.
- Please note that in terms of order and cleanliness, care must be taken to ensure that:
  - all hoses and cables are neatly routed, covered if necessary,
  - Tools in the vicinity of the Syringe pump must be cleaned up,
  - peripheral devices (if any) are placed in such a way that they do not restrict operation or operation,
  - parts lying around and waste (if any) are regularly removed.

5.5.2 Syringe pump assembly process Syringe pump

Proceed as follows during installation:

- ► Remove any transport aids.
- ► Set up the Syringe pump from.
- ► Attach the Syringe pump with matching screws on the insert surface.
- ► Make the electrical connection via plug connection.
- ► Pay attention to a reduction in noise and vibration.
- ► Remove packaging materials such as foils and adhesive tapes and dispose of them properly.

5.6 Connecting to the power supply

5.6.1 Connecting the power supply

⚠ WARNING

Risk of injury due to unexpected activation of the Syringe pump!

An unexpected launch of the Syringe pump Connecting the power supply can result in serious injuries!

- ► Before connecting the power supply, make sure that the main switch of the machine/system on which the power supply is connected Syringe pump is mounted, is in position 0.

⚠ CAUTION

Tripping hazard due to improperly laid energy supply lines!

Failure to do so can result in injuries!

- ► Always lay cables in the supply shaft in a trip-free and barrier-free manner.
- ► Colour-code unavoidable stumbling blocks.

- ► Be attentive and careful when plugging in. Only connect the Syringe pump if you are able to concentrate properly or if you could not pass out.
- ► Check with the manufacturer before using an adapter or extension cord.
- ► Only use damage-free cables, accessories or other peripherals. Contact the manufacturer or an electrician if any parts are damaged.
- ► Use only shielded cables to connect the components to avoid interference. Failure to do so will result in the expiry of the licence to operate the Syringe pump.

- ► Check the Syringe pump and cable for damage before electrical installation. In the event of visible damage, strong odours or excessive heating of components, the power supply must be interrupted immediately and the Syringe pump must not be used.
- ► Protect cables from overloading, crushing or kinking and place it in such a way that people cannot trip over the cable.
- ► Never touch the cable with wet hands.
- ► Protect unconnected pipes from rain and keep them away from moisture.
- ► Use the Syringe pump only if it is correctly and fully installed. Be aware that the manufacturer cannot be held responsible for property damage and/or personal injury due to incorrect installation of the Syringe pump .
- ► Before connecting the syringe pumpSyringe pump that the control voltage is in accordance with the engine data.
- ► Only use cables that are rated for amperage according to specifications.

For grid connection, the relevant VDE regulations and the technical connection regulations (TAB) of the local electricity supply companies must be observed (applies to Germany).

5.6.2 Assembling Syringes

⚠ WARNING

Risk of injury due to the installation of Spritezn!

If the hoses are connected, the operator can be seriously injured!

- ► Have syringes connected only by qualified personnel.
- ► Take appropriate action if damage to a syringe poses a hazard.

6 Put into operation

6.1 Safety measures before commissioning

⚠ WARNING

Risk of injury due to lack of space!

There is a risk of injury such as scrapes, punctures or bone fractures as a result of too close arrangement of the required components and/or parts!

- ► Choose the location of the Syringe pump so that the required movement space of the personnel in the area of operation is not restricted or obstructed.
- ► Only allow qualified personnel to carry out commissioning.
- ► Cordon off the danger area.
- ► Keep unauthorized persons away.
- ► Appoint a responsible person.
- ► Lay power supply lines and hoses in a trip-free and barrier-free way (e.g. under covers).
- ► Identify stumbling blocks.

► Familiarize yourself with the following:

- the equipment of the Syringe pump,
- the functioning of the Syringe pump,
- the immediate environment of the Syringe pump,
- the measures for an emergency.

► Before initial commissioning or recommissioning, perform the following activities:

  ► Check the Syringe pump for visible damage; eliminate any deficiencies identified immediately or report them to the supervisory staff - the Syringe pump may only be operated in perfect condition.

  ► Check and ensure that only authorized persons are present in the area of operation of the Syringe pump and that no other persons are affected by the initiation of the Syringe pump endangered.

  ► Remove all objects and other materials from the area of use that are not suitable for the operation of the Syringe pump are needed.

  ► Keep a commissioning log.

6.2 Installing Guards

⚠ WARNING

Risk of injury due to crushing and pulling!

Failure to install protective devices can lead to serious fatal injuries!

► The Syringe pump must be enclosed by the operator or operated in an enclosed area so that no one enters the Syringe pump can take hold. Consider the safety and minimum distances according to the applicable standards and guidelines.

7 Serve

7.1 Safety measures in normal operation

- ► Observe the safety instructions in chapter "2 Safety“.
- ► Start the Syringe pump only from the specified application area.
- ► Make sure that only authorized persons are in the area of operation of the Syringe pump stop.

7.1.1 General control activities

- ► Carry out the following control activities once a day:
  - ► Check the Syringe pump for externally visible damage.

7.1.2 Electrical wiring control activities

- ► Carry out the following control activities once a day:
  - ► Check all electrical wiring for correct connection.

7.1.3 Hose control activities

- ► Carry out the following control activities once a day:
  - ► Check all syringes for tightness and correct connection.

7.2 Syringe pump set-up

7.2.1 Set-up with syringe

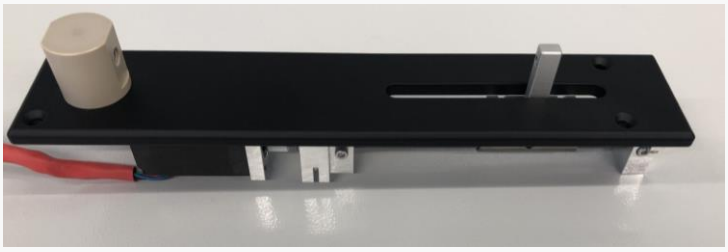
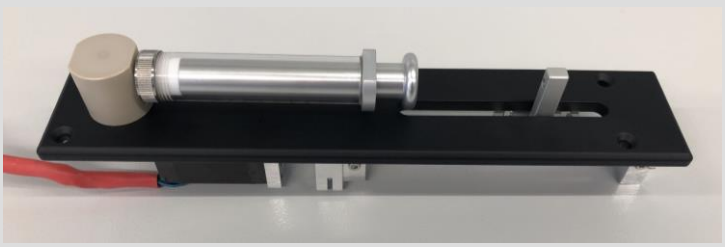
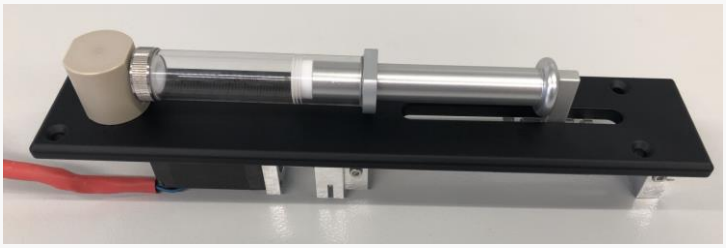
Illustration	Activity
	a) Remove the syringe attachment (thumbscrew) b) Drive the syringe sled near the reference point.
	c) Turn the syringe clockwise into the syringe holder
	d) Pull up the syringe plunger until it is at the syringe slide.
	e) Install the thumbscrew on the syringe plunger

Illustration 7: Clamping the syringe

7.3 Impurities in operation

Your OEM syringe pump is not protected against falling objects in the travel area of the syringe slide. If an object falls into the gap of the syringe slide, please stop any movement of the slide immediately and switch off the device. It may not be operated any further. For further action, please contact Spetec GmbH.

7.4 Syringe pump on/off

The description and mode of operation of the on/off process is specified by the machine/system/device in which the pump is installed and must be described in detail in the operator's operating or assembly instructions. Information on the electrical connection and pin assignment is part of the supplier's installation instructions and is enclosed.

8 Rectifying faults

⚠ WARNING

At the machine there are hazards during fault rectification!

Failure to follow the instructions will result in damage, malfunction or total failure of the Syringe pump as well as the impairment of the security of the Syringe pump the episode!

- ► Before troubleshooting the Syringe pump before any energy source free.
- ► Only have qualified personnel carry out the troubleshooting.

8.1 Disruptions and remedies

- ► In case of electronics malfunctions, contact customer service. Send the peristaltic pump to Spetec for repair or replacement.
- ► In the event of malfunctions of the purchased parts, please refer to the manufacturer's documentation supplied.

Disturbance	Cause	Remedy
No delivery capacity	The syringe is not clamped correctly or is damaged.	Check and ensure correct clamping of the syringe
	The engine of the Syringe pump doesn't run.	Check the engine and power supply.
	A foreign object is blocking the Syringe pump.	Syringe pump inspect for foreign objects and remove blocking parts.
Irregular flow rates or pulsation	Slip-stick effect	Check and minimize back pressures on the system
	Syringe is not suitable for the system.	Check syringe and use a suitable syringe.

Disturbance	Cause	Remedy
Leakage or leakage of the pumped medium	Syringe is damaged or worn.	Check the syringe for damage and wear and replace if necessary.
	Syringe not inserted correctly.	Ensure proper fit of the syringe.
Overheating of the Syringe pump	Syringe pump runs for an extended period of time without interruption.	Check the operating time and schedule breaks.
	Mechanical overload due to blocking components or too high back pressure.	Mechanics of the Syringe pump and remove blocking parts.
	Insufficient ventilation or high ambient temperature.	Improve ventilation and reduce ambient temperature.
Noise or vibration	Syringe is not clamped correctly or worn.	Clamp or replace the syringe correctly.
	Imbalance due to incorrect installation of the pump.	Check the installation of the pump and correct it if necessary.

9 Maintenance and cleaning

9.1 Safety measures during maintenance work

9.1.1 General safety measures during maintenance work

Perform the prescribed maintenance tasks such as cleaning, maintenance and inspections on time. Irregular maintenance shortens operation and service life.

- ► Read the chapter "2 Safety“.
- ► Block access to the area of operation of the Syringe pump off. Ensure that only authorized persons are present in the area of operation of the Syringe pump stop.
- ► Work on low-mounted components should only be carried out in a squatting position, not in a bent position. Carry out work on high-mounted components in an upright, straight posture.
- ► Replace any improper machineHands out immediately.
- ► Use only genuine accessories and spare parts. The use of other parts will void the warranty and suitability and may result in injury.
- ► Ensure that all groundwater-polluting substances (Lubricants, cleaning fluids and other chemical substances or emissions) suitable collection containers are available.
- ► Keep a maintenance log.

After completion of maintenance and before using the Syringe pump the following activities:

- ► Check all previously loosened screw connections again for their tight fit.
- ► Ensure that all tools, materials and other equipment used have been removed from the deployment area.
- ► Clean the application area. Remove any leaked liquids and similar substances.

9.2 Inspection and maintenance work

9.2.1 Maintenance

Maintenance point	Maintenance work	see section
Daily		
Entire Syringe pump	Visual inspection	9.2.4.1

Weekly		
Entire Syringe pump	Visual inspection of warning and information signs	9.2.5.1
Monthly		
Entire Syringe pump	Visual inspection of cable connections	9.2.6.1
Entire Syringe pump	Visual inspection of bolted connections	9.2.6.2
Annual		
Entire Syringe pump	Checking screw connections	9.2.7.1
Special maintenance intervals		
Spline shaft	Check, replace if necessary	9.2.8.1
Entire Syringe pump	Cleaning	9.2.8.2

9.2.2 Preparatory measures Electrics

DANGER

Danger to life due to electric shock!

Energized components lead to a fatal electric shock or serious injury if touched!

- ► Only have work on electrical equipment carried out by a qualified electrician who is specially trained to work on electrical equipment and can identify and avoid hazards.
- ► Before maintenance and inspection work on the Syringe pump the Syringe pump tension-free.
- ► Note that electrical and electronic components must not be cleaned.

9.2.3 Preparatory measures for other energy sources

WARNING

Risk of injury due to working with supply energies!

When working with other supply energies, the operator can be seriously injured!

- ► Only have work on other supply energies carried out by qualified personnel who are specially trained for this work on the other energy sources and who can identify and avoid hazards.

9.2.4 Maintenance - daily

9.2.4.1 Visual inspection

a) Check the Syringe pump for:
   - Mechanical damage,
   - damaged seals,
   - dirt deposits and
   - unfamiliar noises.

b) Report any damage to your supervisor immediately.

9.2.5 Maintenance - weekly

9.2.5.1 Visual inspection of warning and information signs

a) Check all warning and information signs of the Syringe pump on completeness and legibility.

b) Report any damage to your supervisor immediately.

9.2.6 Maintenance - monthly

9.2.6.1 Visual inspection of cable connections

a) Check all cable connections for tightness.

9.2.6.2 Visual inspection of bolted connections

a) Check all bolted connections on the Syringe pump on their firm seat.

b) Tighten loose fittings firmly (screw tightening torque according to the screw size and strength class).

9.2.7 Maintenance - annually

9.2.7.1 Checking screw connections

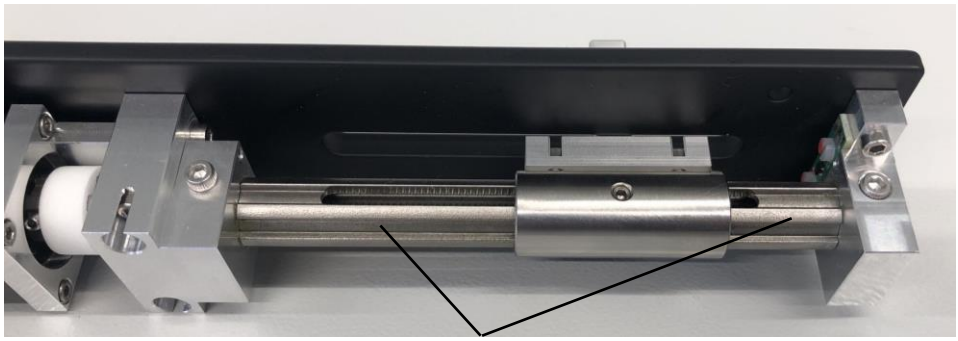
a) Check all screw connections on the Syringe pump for tightness.
b) Tighten loose fittings firmly (screw tightening torque according to the screw size and strength class).

9.2.8 Special maintenance intervals

9.2.8.1 Lubricate spline shaft

If the grease on the spline shaft becomes dry, it must be re-lubricated. As a rule, this is necessary after 50,000 cycles. The cycle is defined as the movement of the syringe carriage from one end position to the other end position and back again.

a) Check whether the lifetime has been observed.
b) Check for fluid leakage, which allows the lubrication to be washed off prematurely.
c) If necessary, remove residues of the dried fat.
d) Re-lubricate the spline shaft with a special grease (see spare parts list).



Apply relubrication grease on both sides of the spline shaft

Figure 8: Re-lubrication spline shaft

9.2.8.2 Clean

When cleaning the Syringe pump as follows:

a) Thoroughly clean all machinecomponents and remove impurities, dust and foreign objects from the entire machinearea. For this purpose, detergents with 99% ethanol (13-0017) must be used. Never clean the Syringe pump with high-pressure cleaners or degreasing detergents.
b) Clean the syringe pump with a dry or slightly damp, lint-free cloth. Note that excessive detergent can cause the lubricant to wash out on the spline shaft.
c) Do not use abrasive cleaning wipes or chemicals to clean the Syringe pump, as they can damage the surface.

9.2.9 Maintaining third-party components

Further information on maintenance work on third-party components can be found in the documentation of the suppliers.

10 Decommissioning and dismantling

⚠ WARNING

Risk of serious injury due to improper decommissioning/disposal!

Failure to do so can result in serious injury!

- ► Only have the dismantling work carried out by qualified or instructed personnel. Note that the staff has practical experience in dismantling the machine must have.
- ► Before dismantling, switch off the Syringe pump from.
- ► Always wear the protective equipment necessary for the respective work (e.g. protective clothing, safety shoes, protective gloves and safety helmet) during work.
- ► If in doubt, contact Spetec GmbH.

10.1 Decommission

10.1.1 Decommissioning the electrical system

a) Turn on the Syringe pump from.

b) Prevent or restrict access to the Syringe pump one.

c) Have energy supply lines disconnected by appropriate specialist personnel.

⚠ DANGER

Danger to life due to electric shock!

When working on the electrical system, there is a danger to the lives of unqualified personnel!

- ► Have all work on the electrical system carried out only by qualified electricians. Qualified electricians are specially trained to work on electrical systems, know the dangers of electrical voltage and can independently avoid possible hazards by acting correctly.
- ► Before decommissioning and disassembling, turn off the machine tension-free.

DANGER

Danger to life due to uncontrolled reactivation and electric shock!

Uncontrolled reactivation or electric shock can lead to serious personal injury!

► Have the decommissioning work carried out only by authorized and qualified specialists.

► Apply the 5 safety rules:

1. Unlock.
2. Secure against reconnection.
3. Determine the absence of tension.
4. Grounding and short-circuiting.
5. Cover or fence off adjacent live parts.

10.1.2 Decommissioning syringes

a) Turn on the Syringe pump from.
b) Prevent or restrict access to the Syringe pump one.
c) Have syringes dismantled by appropriate specialist personnel.

WARNING

Risk of injury from working with hoses!

When working with sprayers, the operator can be seriously injured!

► Only have work with syringes carried out by qualified personnel.

10.2 Dismantle

⚠ CAUTION

Danger from dismantling work!

When dismantling, there is a risk of injuries such as scrapes, punctures or bruises!

- ► Only allow instructed and authorized personnel to carry out dismantling work.
- ► Always wear the protective equipment necessary for the respective work (e.g. protective clothing, safety goggles, safety shoes and safety helmet) during work.

⚠ WARNING

Risk of injury due to too close arrangement of components!

Failure to do so can result in serious injury!

- ► Cordon off the danger area.
- ► Keep unauthorized persons out of the danger zone.
- ► Appoint a person responsible for the dismantling activities.
- ► Always wear the protective equipment necessary for the respective work (e.g. protective clothing, safety goggles, safety shoes and safety helmet) during work.

10.3 Dispose

⚠ WARNING

Risk of pollution/waste of resources!

Failure to do so can result in environmental damage!

- ► Only allow instructed and authorized personnel to carry out disposal work.

- ► Separate materials and packaging waste by type and recycle them. Recycle the materials that have a recycling symbol on them. The packaging is made from various materials that can be disposed of through your local recycling facility. By disposing of the packaging properly, you help to avoid possible dangers to the environment and public health.
- ► Observe local recycling regulations.
- ► When disposing of them, observe all relevant, nationally applicable requirements and regulations.
- ► Dispose of the Syringe pump not about household waste.

10.3.1 Disposing of electrics

⚠ WARNING

Risk of pollution/waste of resources!

Failure to do so can result in environmental damage!

- ► Only allow instructed and authorized personnel to carry out disposal work.
- ► Separate electrical and electronic components in accordance with Directive 2012/19/EU.

10.3.2 Disposing of auxiliary and operating materials

⚠ WARNING

Risk of pollution/waste of resources!

Failure to do so can result in environmental damage!

- ► Only allow instructed and authorized personnel to carry out disposal work.
- ► Dispose of detergents and aids used to clean the machine were used, in accordance with local regulations and in compliance with the instructions in the manufacturers' safety data sheets.
- ► Collect liquids (if applicable) and separate them.
- ► Make sure that auxiliary or operating materials do not get into the groundwater, water bodies or the sewer system.
- ► Dispose of auxiliary or operating materials in accordance with applicable regulations or, if necessary, contact Spetec GmbH.

11 Appendix

11.1 Declaration of incorporation

On the following pages you will find the declaration of incorporation for the present incomplete machine and the attached documents.

Declaration of incorporation

(Original Declaration of Installation)

Manufacturer/Authorized Representative:	Spetec GmbH, Am Kletthamer Feld 15, D-85435 Erding
Authorised person for the compilation of technical documentation:	Spetec GmbH, Am Kletthamer Feld 15, D-85435 Erding
Product:	Syringe pump
machineIdentification number:	see nameplate
Function:	The syringe pumps are designed exclusively for dosing and conveying various liquid media with high precision and minimal pulsation.

We hereby declare that the above-mentioned incomplete machine complies with the following provisions of the Machinery Directive 2006/42/EC:

- 1.1.2, 1.1.3, 1.1.5, 1.1.6, 1.3.2, 1.3.4, 1.3.7, 1.5.2, 1.5.4, 1.5.5, 1.5.6, 1.5.8, 1.5.10, 1.5.11, 1.6.1, 1.6.2, 1.6.4, 1.6.5, 1.7.1, 1.7.2, 1.7.3, 1.7.4

Other Directives and harmonised standards applied (or parts thereof):

- 2011/65/EU + (EU) 2015/863 - RoHs EU Directive
- EN ISO 12100
- EN 61010-1

The special technical documentation has been prepared in accordance with Annex VII Part B of the Machinery Directive 2006/42/EC. We undertake to transmit these to the market surveillance authorities in electronic form within a reasonable period of time upon justified request. The incomplete machine may not be put into service until it has been established that the machine in which the incomplete machine is to be installed complies with all the safety requirements of the Machinery Directive.

D-85435 Erding, 21.05.2025

Stephan Thalhammer, Product Manager

11.2 Spare parts list

11.2.1 Precision Syringe

Designation	Item no.
Lubricant spline shaft	10-0005

11.3 Attached documents

The following documents are included in this Original Operating & Installation Instructions attached:

11.3.1 Manufacturer's documentation of purchased components

The appendix to the Original Operating & Installation Instructions consists of the following documents:

- Manufacturer's documentation of purchased components

11.3.2 Documents Custom Pump

The appendix of the custom pump documents consists of the following documents:

- Specification
- Assembly drawing
- Stepper motor
- Printed circuit board