


Operating Instructions
Original operating instructions
Item No.: 99988104
Rev: 02/ 10.2019

Double diaphragm pump
PTI-MEM 1150
Version magnetic sensor

Year of construction: 2020



CE  II 2 G Ex h IIB T6-T4 Gb X

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This manual is intended for everyone who is assigned to perform tasks on and with the pump. It contains guidelines and drawings that must not, neither in whole nor in part, be duplicated, disseminated used for competitive purposes, or communicated to other persons without authorisation.

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1 EU Declaration of Conformity

DESIGN: DOUBLE DIAPHRAGM PUMP
Type: PTI-MEM1150
Variant: Magnetic sensor
ATEX marking:   II2 G Ex h IIB T6-T4 Gb X

The double diaphragm pump has been designed and manufactured in accordance with EC directives:

Directive 2006/42/EC EU Gazette L157/24 of 17 May 2006

Directive 2014/34/EU, EU Gazette, L 96/309 of 26 February 2014

under the sole responsibility of (manufacturer):

Timmer GmbH

Dieselstrasse 37

D-48485 Neuenkirchen, Germany

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The following harmonised standards have been applied:

EN ISO 12100:2010 Safety of machinery –

General principles of design – Risk assessment and risk reduction

EN 809:1998+A1:2009 Pumps and pump units for liquids – Common safety requirements

EN ISO 4414:2010 Pneumatic fluid power - General rules and safety requirements for systems and their components

DIN EN ISO80079-36:2016: Explosive atmospheres - Part 36: Non-electrical equipment for explosive atmospheres– Basic method and requirements (ISO 80079-36:2016)

DIN EN ISO80079-37:2016: Explosive atmospheres - Part 37: Non-electrical equipment for explosive atmospheres - Non-electrical type of protection constructional safety "c", control of ignition sources "b", liquid immersion "k" (ISO 80079-37:2016)

Person responsible for compiling the documentation: Timmer GmbH

Address: See manufacturer

Commissioning in potentially explosive atmospheres is prohibited until it has been established that the special conditions specified in the installation and operating instructions for the intended use in potentially explosive atmospheres have been fulfilled. The conformity of the installed electrical device is confirmed by a separate declaration of conformity.

Neuenkirchen, 10.2019

City, date

Managing Director (Klaus Gehrmann)

2 About this manual

2.1 Use and safekeeping:

Please note the following points:

- The pump can only be appropriately and safely placed in service, operated and maintained with the aid of this operating manual.
- This operating manual refers only to the product that is specified on the cover sheet.
- This operating manual is a component of the scope of delivery.
- Consequently, always keep this operating manual in legible condition, on hand for the operator in the vicinity of the pump. Leave this document with the pump if the pump is resold or loaned out.
- This operating manual is intended only for instructed and authorised specialists.
- The section on safety provides an overview of all important safety aspects for optimal protection of personnel, and for safe and trouble-free operation of the pump.
- The manufacturer is not liable for damage resulting from failure to comply with the instructions in this operating manual.
- Reprints, translations and duplications in any form, including excerpts, requires the written consent of the publisher.
- The copyright remains with the manufacturer.

2.2 Manufacturer information

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2.3 Areas of applicability

This product complies with the directives of the European Union.

In this regard, please note:

- This EU Declaration of Conformity
- The intended use
- The improper use

2.4 Warranty

For all Timmer pumps, we grant the initial purchaser a one year warranty on workmanship and material starting from the date of purchase; provided that the pump is used as intended. Normal wear is excluded from the warranty. The warranty is invalidated automatically if the parts that are not original Timmer spare parts are installed in the Timmer pump.

In compliance with applicable law, Timmer GmbH excludes all liability for consequential damage. In all cases the liability of Timmer GmbH shall be restricted to and in no case shall exceed the equivalent value of the purchase price. Prior to purchasing and shipment of the Timmer pump, the customer should review the national and local laws and regulations to ensure that the product, the installation and the application are in compliance with the applicable regulations.

- Notify the manufacturer immediately of warranty claims after defects or faults are detected.
- In all cases the warranty shall be invalidated where liability claims cannot be legally asserted.
- Claims for modification of systems and components that have already been delivered cannot be asserted from the information, illustrations and descriptions in this operating manual.
- No liability is accepted for damage or malfunctions that occur as described below:
 - Disregard of the operating manual
 - Unauthorised modifications of the system
 - Operator error
 - Failure to perform maintenance tasks

3 Safety

3.1 Basic information concerning safety

The Safety chapter provides an overview of all important safety aspects for optimal protection of personnel, as well as for safe and trouble-free use of the pump, from transport to operation and extending to disposal.

Failure to comply with the instructions and safety notices cited in this operating manual can result in considerable hazards for personnel and material damage of pump.

The pump is operationally safe.

Nevertheless under the following circumstances residual risks can arise from the pump, if

- The pump is not used as intended.
- The pump is used improperly operated by untrained or uninstructed personnel.
- The pump is not properly maintained or serviced.
- The safety instructions, notices and warnings specified in this operating manual are not complied with.
- The pump is improperly modified or converted.
- The prescribed maintenance is not performed in a timely manner.
- In the event of a diaphragm rupture, the medium to be pumped can escape from the silencer. In case of a prolonged operation of the defective pump, this can result in medium leakage out of the pump. The operator has to make sure by organisational and structural measures that dangerous liquids pose no risk.

3.2 Compliance with the instructions in the operating manual

Every person who is assigned to perform tasks on and with the pump must have read and under this operating manual, particularly the "Safety" chapter.

Knowledge of and compliance with the content of this manual is the prerequisite for protecting personnel from danger and avoiding error.

Consequently, all safety instructions must always be complied with, compliance is in the interest of your safety.

The operating manual is a component of the pump and must always be available in the vicinity of the product. The instructions in the operating manual must be complied with. If content of this operating manual is not clear or not understandable, contact the manufacturer without delay, see the paragraph "Manufacturer information".

In addition to the safety instructions in this operating manual the following guidelines and regulations must also be complied with:

- The intended use
- The applicable accident prevention regulations (UVV)
- Occupational medical health guidelines
- Generally accepted rules for safety
- Country-specific regulations
- The manufacturer information (safety data sheets) for operating materials and auxiliary materials, chemical substances

Moreover, these directives and regulations can be supplemented with work instructions that take into account plant-internal regulations or operational particularities.

In supplementation to this operating manual, company-internal instruction of the appropriate persons must be provided with due consideration of the technical qualifications.

At the same time, the instructions in the operating manuals of the installed electrical equipment must be observed and complied with.

3.3 Operational prerequisites

Dependence on other systems and equipment must be tested by the owner separately.

Moreover, since they are not in our area of responsibility, the following prerequisites must be in place for regular operation of the pump:

- Properly concluded installation.
- Successful trial run with all required adjustment tasks.
- Instruction of operating personnel concerning operation of the pump and the applicable safety regulations.
- If hot or cold machine parts result in additional danger, then the customer must safeguard these parts from being touched.
- The possibility of hazards due to electrical energy must be excluded (for details in this regard see VDE guidelines or guidelines issued by the electrical utility, for example).
- The pump must be easily accessible.
- Designation of a person who is mainly responsible for proper operation.

3.4 Intended use

- The pump and the operating manual are designed exclusively for commercial use.
- The pump may only be used for pumping liquid media (see chapter "Technical data").
- The pump must only be operated within the limits specified for intended use (see the chapter "Technical data").
- The pump must only be operated in buildings.
- The pumped medium must be compatible with the materials of the pump (see the chapter "Technical data").
- The owner of the pump is responsible for selection of the medium to be pumped.

3.5 Non-intended use

A use other than the use described in the section, "Intended use" and in this operating manual, and any use that extends beyond the specified intended use, is considered non-intended use. The manufacturer shall not be liable for damage resulting from non-intended use. This risk is borne solely by the user / owner.

- Pumping of media that does not meet the product specification
- Do not modify the pump in any manner whatsoever.
- Use of the pump for purposes other than those cited in section Kap. 3.4
- Operating a damaged pump
- Operation, maintenance and repair of the system by unauthorised and/or untrained personnel
- Pump operation without earthing
- Pump operation outside of the specified parameters and/or operating data
- Operating the pump at a location where there are ignition hazards due to sources of ignition in the vicinity of the pump
- Use or commissioning of the pump by private users
- Modifying or converting the pump
- Set up on unsuitable substrates
- Attaching transport aids on the housing
- Failure to comply with the specified maintenance intervals
- Operating the pump in Zone 0 explosive gas/dust atmospheres
- Immersing the pump in the pumped medium
- Operation in explosive atmospheres without prior implementation of the requirements stipulated in Directive 1999/92/EC and national regulations for explosion protection, on the part of the owner
- Initial commissioning without prior inspection of the area and the pump by a person qualified to perform the inspection
- Pumping of media that is chemically incompatible with the materials used to construct the pump – The owner of the pump must check the chemical compatibility of the pumped media
- Pumping of media with parameters (e.g. ignition temperatures) that are not compatible with the information specified on the pump
- Operating the pump with bypassed safety devices is prohibited

3.6 Foreseeable misuse

The following points describe foreseeable misuse of the pump:

- Installation on unsuitable grounds or flooring
- Attachment of transport aids on the housing
- Failure to comply with the operating data
- Failure to comply with the maintenance intervals
- Operation with unsuitable media
- Operation in the wrong Ex zone

3.7 Plates/labels on the pump

The data on the rating plate affixed on the pump must always be complied with. The rating plate must not be removed, and it must be kept in completely legible condition.

3.7.1 Rating plate

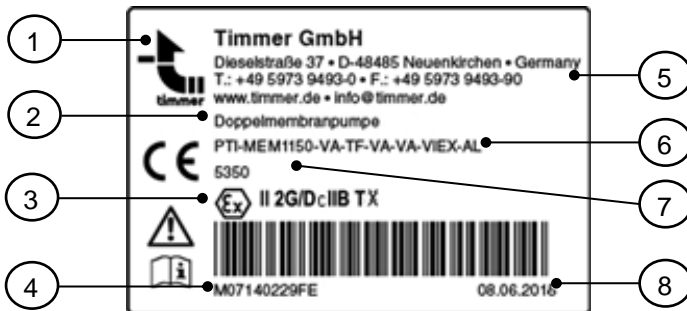


Fig. 1: Rating plate

- | | | | |
|---|--|---|----------------------|
| 1 | Logo | 5 | Manufacturer address |
| 2 | Product designation | 6 | Type key |
| 3 | ATEX marking according to RL2014/34/EU | 7 | Article number |
| 4 | Serial number | 8 | Date |

3.8 Personnel qualifications

Tasks on the pump must only be performed in accordance with existing rules and statutory regulations, by personnel who have been instructed and are qualified in this regard, in compliance with due diligence obligations.

The following requirements must be fulfilled:

- Personnel must have special skills and experience in the respective technical area. This particularly applies for maintenance and repair tasks on mechanical and pneumatic fixtures of the pump.
- Personnel must have knowledge of applicable standards, directives, accident prevention regulations and operating conditions.
- Personnel must have been authorised by the person responsible for safety to perform the respectively required tasks.
- Personnel must be capable of recognising and avoiding possible dangers.

The required personnel qualifications are subject to different statutory regulations depending on the implementation site. The owner must ensure compliance with the applicable laws.

3.9 Personal protective equipment

Failure to wear the personal protective equipment can result in severe injury or death.

- Wear the plant prescribed protective equipment, e.g. hearing protection, eye protection, safety footwear, hard hat, protective clothing, and protective gloves for all tasks on the pump.



- Long hair must be tied back and covered; do not wear loose clothing or jewellery. Danger of injury through entrapment, being pulled in or entanglement due to moving parts.
- Ensure that there are no unauthorised persons in the danger zone.

3.10 Safety notices in the operating manual

WARNING

The signal word **WARNING** indicates a possible danger.
Failure to comply with the instruction can result in severe or fatal injury.

CAUTION

The signal word **CAUTION** indicates a possible danger.
Failure to comply with the instruction can result in minor to moderate injury.

! Attention

The signal word **Attention** indicates possible material damage.
Failure to comply with the instruction can result in machine damage.

Environmental protection notice

The signal word **Environmental protection notice** indicates information on environmental protection.

Note

The signal word **Note** indicates additional information for the machine its use.

3.11 Safety instructions

CAUTION

Danger to persons by a defective pump!

- Check the pump regularly for damage and leaks.
- Switch off a damaged or leaking pump immediately.

CAUTION

Health impairment due to contact with harmful media!

- Only perform cleaning, repairs, troubleshooting and fault rectification in which the possibility of contact with the medium cannot be excluded, if beforehand you have put on the appropriate personal protective equipment PSA (at least protective clothing, protective gloves, protective goggles).
- Comply with the safety data sheets of the manufacturers and the national laws and directives.
- Check liquids that escape from the pump before contact for danger. Take protective measures if necessary.

Attention

Damage to the pump due to the operating conditions and properties of the pumped media!

- The characteristics of the pump media (such as abrasiveness, viscosity, etc.) and the operating conditions can negatively influence the service life and the operation of the pump.
- Solids in the media can damage the pump, especially the diaphragm, and cause an immediate breakdown.
- The pump is basically not designed to convey solids. Solids can theoretically pass through the pump in a small amount up to a maximum edge length of 1mm or Ø1mm. Membrane damage cannot be excluded with solids.

Attention

Pump damage due to chemical incompatible media!

- The owner of the pump must check the chemical compatibility of the pumped media with the materials used to construct the pump.
A list of the materials used in the pump is provided in the chapter "Technical data".

Attention

Damage to the pump due to high mechanical forces!

- Do not subject the pump to major mechanical forces.

Attention

Destruction of the pump due to excessive air pressure!

Excessive air pressure can destroy the diaphragm and cause the pump to burst.

- Operate the pump with compressed air pressure of maximum 7 bar.
- Ensure that the exit point of the pumped medium is not clogged or sealed.

WARNING

Danger of explosion due to improper installation tasks!

- During installation and dismantling, maintenance, transport to/from the place of use, and maintenance there is danger of generating sparks through friction, impact and rubbing processes or through electrostatic charging. Consequently, ensure that these hazards are safely eliminated or that an explosive atmosphere is not present during these work stages.

 **WARNING****When handling dangerous substances:**

The following instructions must be complied with if the hazard analysis conducted by the owner reveals that a possible leak of the medium poses an increased risk:


- The installation of media shut-off valves at the medium inlets and outlets to shut off the medium flow in case of a leakage on the pump.
- The installation of the pump with shut-off valve, 3-way valve and check valve in the compressed air supply line. These 3 components prevent the pumped medium from entering the compressed air system if a diaphragm tears.
- If diaphragms are completely defective, the fluid can enter the compressed air circuit, damage the compressed air circuit and exit via the silencer. Depending on the pumped medium, the silencer must be replaced by a suitable pipe or hose connection to avoid danger. The discharge must be taken to safe place.
- If diaphragms are completely defective, the medium to be pumped can react with materials in the compressed air circuit. Prior to commissioning the owner must assess the risk and take suitable measures.


**Environmental protection notice****Environmental pollution due to pumped media and cleaning agents.**

- Regularly check all lines, hoses and connections for leaks and apparent damage. Immediately repair any damage!
- Take up or wipe up leaked and spilled media and cleaning agents and dispose of them in an eco-friendly manner.
- Prevent escaped or spilled media and cleaning agents from getting into the groundwater.
- For safe and eco-friendly disposal of media, cleaning agents and replacement parts.
- Comply with the safety regulations applicable to the media and cleaning agents.

4 Additional ATEX information

4.1 ATEX marking in accordance with Directive 2014/34/EU and DIN EN ISO 80079-36 for the pump

CE  **2G Ex h IIB T6-T4 Gb X**

Symbol	Meaning
CE	CE mark.
	Marking relevant for explosion prevention in accordance with ATEX.
II	Atex device of Equipment Category II intended for use in explosive atmospheres, except for mines.
h	Non-electrical device for the explosive area.
2 G	ATEX device of Equipment Category 2 (avoidance of effective ignition sources). The device can be used as intended in areas where Zone 1 and Zone 2 explosive gas or dust atmospheres can occur. Use of the device is prohibited in Zone 0.
IIB	The intended use is permitted in gas explosive areas with gases and vapours of explosion groups IIA and IIB. The intended use is not permitted in gas explosive areas with gases and vapours of explosion group IIC.
T6-T4	Temperature class for the gas explosion hazardous area. The actual maximum surface temperature does not depend on the device; but rather it depends on the operating conditions (medium temperature and compressed air temperature).
Gb	Device protection class for gas or dust. In normal operation and for the faults that can usually be expected (defects on the device), the device ensures the required degree of safety and avoidance of ignition sources.
X	The following special conditions must be met to ensure safe operation of the pump in explosive atmospheres. Pay attention to the limited ambient temperature. Mechanisms/processes that generate stronger charges than are generated through manual rubbing, must be prevented on the labels, the silencer and possibly the diaphragm.

WARNING

Danger due to highly effective charge-generating processes!

- Highly efficient charge-generating processes can cause electrostatically dangerous charging of diaphragms that have a non-dissipative layer (e.g. PTFE) on the media side. Highly-effective processes that generate static charges, include flange purging of multiphase fluids and liquids with low conductivity ($< 100 \text{ pS/m}$) and the purging of the pump with compressed air.
The owner must take additional protective measures to safely prevent these processes. Possible measures include:
 - Filling the pipes and pump chambers with inert gas during dry-run
 - Slow filling and emptying of the pump
 - Reliable avoidance of dry-run (slurp operation)
- Highly-effective charge-generating processes can cause electrostatic charging of labels/stickers, silencers and ball valve handles. Highly efficient processes that generate charges include cleaning the pump with a high-pressure cleaner.
The owner must take additional protective measures to safely prevent these processes. Possible measures include:
 - Large-area, permanent covering of the labels/stickers with transparent conductive foil, or the removal of such labels/stickers (rating plates must not be removed).
 - Replacement of the silencer with a conductive/dissipative silencer.

WARNING

Danger of explosion due to hot surfaces!

The maximum surface temperature is equal to the max. temperature of the pumped medium and/or the compressed air temperature.

- In accordance with national regulations, the medium temperature/compressed air temperature must with certainty and with a sufficient differential, be lower than the ignition temperature of the explosive atmosphere.

4.1.1 Ignition sources in the device

Mechanically generated sparks, chemical reaction and static electricity are potential ignition sources in the pump. The effectiveness of these ignition sources is reliably prevented, even in event of the usual errors, through integration into the equipotential bonding system and by limiting the operating parameter settings and ambient conditions.

The ignition hazards of the electrical device (intelligent stroke counter) can be found in its operating instructions. The electrical device may only be operated with the specified electrical parameters.

4.2 Optional Components

The pump is equipped with a stroke counter.

The partial devices, pump and stroke counter comply with the directive 2014/34/EU, which is confirmed by the declarations of conformity of the manufacturers. The sensor has been installed according to the manufacturer's instructions.

The entire assembly has been subjected to a risk assessment for the additional ignition hazards and other relevant hazards that become relevant as a result of the final combination.

It was determined that the assembly did not alter the explosion characteristics of the sub-assemblies with respect to the essential health and safety requirements and that there are no additional ignition hazards.

The functional unit as a whole is therefore not an equipment unit falling within the scope of Directive 2014/34/EC. The assembly, consisting of sensor and pump, is not to be understood as a new product within the meaning of the Atex Directive 2014/34/EU. With regard to explosion protection, it must therefore be regarded as a combination of "individual sub-assemblies". Timmer therefore provides the EU Declaration of Conformity of the partial devices and does not issue an overall Declaration of Conformity.

The ATEX guidelines (ATEX guidelines for Directive 2014/34/EU, 1st edition of April 2016) in § 44 "Combined components (assemblies)" 2.a) provide detailed information on how to proceed with regard to an assembly.

4.3 Explosion-protected sub-assemblies

Nr.	designation	manufacturer	type	device identification
1	Magnetic proximity sensor	SICK	MM12-60A-N-ZCO (Art-Nr 7900287)	II 2G Ex ib IIC T6 Gb -25°C ≤Ta≤+70°C

5 Transport

Transport the pump only in its original packaging as far as possible to prevent transport damage.

5.1 Check scope of delivery

1. Remove the transport packaging of the pump.
2. Dispose of the packaging material correctly.
2. Examine the pump for transport damage.
 - Immediately notify the transport company and the manufacturer of transport damage in writing.
 - Protect the pump from further damage.
3. Use the packing slip to verify the completeness of the deliver

6 Storage

- The storage conditions influence the service life of the diaphragm.
- The pump must only be stored for safekeeping if it has been thoroughly cleaned beforehand.
- Extreme storage conditions accelerate the ageing process.
- We recommend a storage temperature between +10 °C and +25 °C.
- The high-pressure diaphragm must not be exposed to heat sources or direct sunlight.
- Exclude the possibility of influence of ozone or ionising radiation.
- Store the diaphragm in unstressed condition.
- We recommend to replace the diaphragm at the latest after one year storage under the above-mentioned storage conditions.

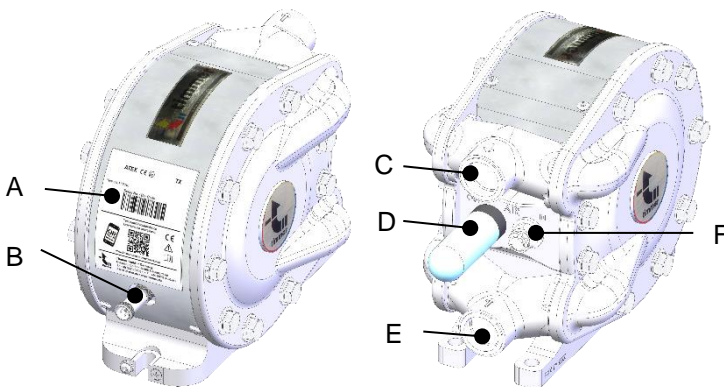
7 Product description

The double diaphragm pump is a self-priming, pneumatically-powered fluid pump. The liquid is pumped through the opposite movement of two diaphragms. A reversing valve ensures that the two diaphragms are alternately charged with compressed air. Each diaphragm comprises a liquid inlet valve and liquid outlet valve.

When the diaphragm is enlarged due to the movement of the pump chamber, the outlet valve closes and the inlet valve opens so that the liquid is sucked into the pump chamber. When the diagram is moving in another direction, the pump chamber becomes smaller, the inlet valve closes, the outlet valve opens and the liquid is sucked out.

When one of the diaphragms reaches its end position during the suction process, the end switch operates the reversing valve so that the other diaphragm is charged with air.

The reversing valve is designed in such a way that it cannot stay in the central position.



Position	Bezeichnung
A	Type plate
B	Connection stroke counter
C	Media outlet
D	Silencer
E	Media entrance
F	Compressed air connection

8 Installation**8.1 Safety instructions** **WARNING****Danger of explosion due to electrostatic charge!**

- Connect the pump before the start-up to the protective earth system (potential equalisation).
 - The pump is not connected to the grounding system during installation. There is the risk of electrostatic charge.
-

 **WARNING****Danger to persons due to improper installation!**

- Use connections whose material is compatible with the pumped medium and the material of the pump.
 - The pump has its own compressed air shut-off valve to shut off the pump. If this is not accessible during operation, an additional, easily accessible shut-off valve must be installed.
 - The pump must be integrated into the compressed air system in such a way that it can be put out of operation by switching off the compressed air.
 - Select the installation site for the pump in such a way that ignitable impacts are excluded.
 - The compressed air supply (hoses, etc.) must be installed in such a way that it does not present any danger..
 - Use a pressure relief valve in the compressed air supply if there is a risk of the operating parameters being exceeded..
 - Installation work may only be carried out by trained personnel.
 - Wear personal protective equipment (PPE)
-

 **CAUTION****Personnel are in danger due to inadequate lighting!**

- Only perform installation tasks on the pump in an adequately illuminated and air-conditioned environment.

Attention**Multifunction or damage due to residual substances in the pump!**

- Prior to commissioning purge the pump with suitable media to remove from the pump interior any substances introduced during the customer process (goods receipt, handling, storage, installation, etc.) that may impair paint wetting, substances that are incompatible with the pumped medium.
- For this, section 12 Cleaning must be complied with!

8.2 Preparations

- Do not use the pump as support for the pipeline system.
- Ensure that the system components are properly supported to prevent stress on the pump parts.
- Make sure that the provisions regarding the protective earth system (potential equalisation) are met.
- During assembly and dismantling, transport to/from the location of use and initial start-up, there is a risk of sparks, electrostatic charge, etc. It has to be ensured that these dangers are reliably prevented or that there is no potentially explosive atmosphere.

 **Note**

- An electrical connection is not required.
- The pump is self-priming.

8.3 Connection

1. Install the pump on a horizontal, level surface with the pump base down. Make sure the pump is in a stable position by fixing using suitable fixing screws.
Do not immerse the pump into the pumped medium.

Install a compressed air hose from the compressed air source to the pump.

Pump with springs in the media valves

A different positioning of the pump is possible, but in this case the pump chambers must be vented during commissioning.

Start the pump in a preferred horizontal position with maximum frequency.

2. Lay a compressed air hose from the compressed air source to the pump.

There is a G1/2" (1) connection thread on the pump.

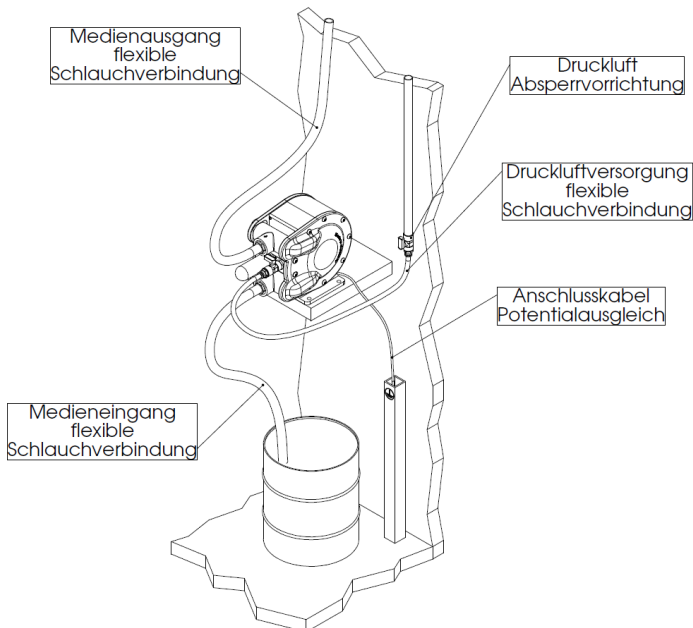
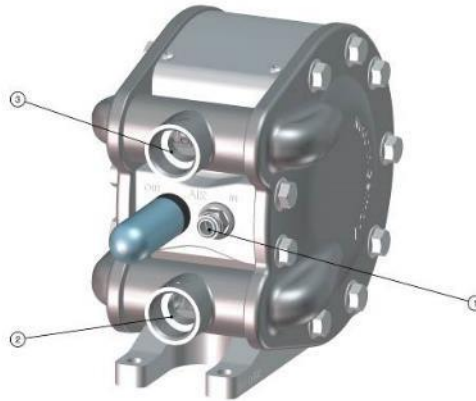


Fig. 2: Pump connections

- Use flexible connections (for example hose connections) for intake and delivery.

Flexible connections prevent the transmission of vibrations to the pipeline system.

4. Ensure that the connectors are compatible with the medium to be conveyed and are able to withstand high pressures.
5. Dimension the piping cross-sections sufficiently large.
The sizes depend on the medium viscosity and the situation of the equipment.
6. Use suitable hose clamps to connect the intake and delivery hose.
The direction of flow is indicated by arrows on the pump casing. These arrows must be observed, not removed and kept in a clearly visible condition.
7. Connect the intake hose with the entry point (2).
8. Connect the delivery hose with the exit point (3).
9. Connect to the pump with the protective earth system.
The connection for the potential equalisation is correspondingly marked at the pump base (1).

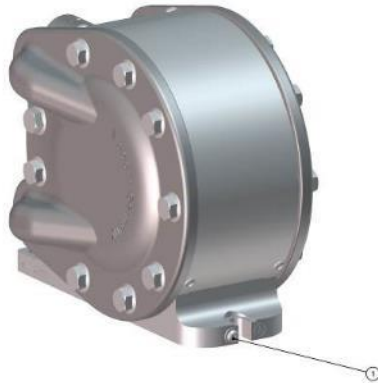


Fig. 3: Connection for potential equalization

10. Check all connections for tightness and proper seating.
11. Connect the compressed air hose to the compressed air supply of the pump.

9 Commissioning

9.1 Safety instructions

WARNING

Danger of explosion due to dust on the pump housing!


- Regularly clean the surface of the pump housing and remove the dust layers.

WARNING

Danger to life by pumping explosive media in explosive areas!

The pumped medium can attack the components of the part or damage them and escape. This can result in an explosive mixture.

- Conveying explosive media or gases and the use in explosive areas is only allowed if the following marking is used on the nameplate of the pump according to the Directive 2014/34/EU as intended:

CE  II 2 G Ex h IIB T6-T4 Gb X

 **WARNING****Danger to life when operating the pump in potentially-explosive areas!**

- The pump may be used in potentially-explosive areas (for example paint shops) only when this is correspondingly indicated on the pump nameplate.
- Furthermore the component has to comply with the provisions required by the Directive 1999/92/EC.
- The pump may only be used in potentially explosive atmospheres (e.g. paint shops) if the ATEX markings on the nameplates of the pump and its subassemblies meet the requirements of the zone classification.
- During operation it must be ensured that the pump is always completely filled with liquid. The permanent pumping of ignitable gas/liquid mixtures so that a zone 0 is created within the pump is prohibited.
- Furthermore, the operator of the pump is responsible for complying with the regulations required by Directive 1999/92/EC.
- The medium to be pumped may react exothermically with the material of the pump. Before the medium is pumped, the suitability of the pump materials for the medium to be pumped must be checked.
- Operating the pump above the permissible flow rate and prolonged operation in dry running can lead to overheating of the pump.
- When pumping media in ring systems, the flow rate of the pump is converted into heat. In short pipelines this can lead to dangerous heating of the medium.
- Explosive gas mixtures can be adiabatically compressed in the pump and/or the piping system by operating the pump. This can lead to ignitable temperature increases. The operator must take suitable measures. The media outlet must not be closed during operation of the pump.
- The special operating conditions of the pump must be observed and complied with.
- Impacts on the outer aluminium housing parts can lead to sparks which can cause ignition.

Attention

Destruction of the pump due to excessive air pressure!

Excessive air pressure can destroy the diaphragm and cause the pump to burst.

- Operate the pump with compressed air pressure of maximum 7 bar.
- Ensure that the exit point of the pumped medium is not clogged or sealed.

1. If the pump has not been mounted on a horizontal flat surface with the pump base mounted downwards, the function of the fluid check valves is not provided.
2. Set the air pressure between 1 and 7 bar.
The pump is ready for operation.
3. Open the ball valve for the compressed air supply.
The pump starts pumping.
4. Operate the pump with compressed air pressure of maximum 8 bar.

10 Operation

10.1 Regulating the delivery rate

► Note

If the delivery rate of the pump must be regulated, the owner has to install a throttle valve into the compressed air supply or into the delivery line.

Reducing the delivery rate

- Reduce the compressed air supply or the medium outlet.

Increasing the delivery rate

- Increase the compressed air supply or the medium outlet.

11 Fault rectification

Fault	Cause of the error	Error rectification
Pump not running or is running too slow	Insufficient compressed air pressure	Set pressure between 4 and 8 bar
	Cross section of the hose is too small	Use a hose with a larger cross section
	Control valve leaking	Renew control valve and seals
	Blockage of the sound absorbers, pump running heavily, seal is welled or piston material damaged	Check material strength, avoid dry running
Pump is running but does not pump the medium or stops when the pressure side is shut off	Valves clogged	Clean the pump with detergent
	Delivery hose clogged	Clean delivery hose
	Suction and pressure valves clogged	Allow the pump running at maximum speed for a short time
	Connections leaking, possibly intake of tramp air, vacuum collapses	Check connections for leak and re-seal
	Valves clogged	Clean or renew the valves
	No suction effect	Put your hand over the openings to feel the suction effect and, if necessary, replace the seals
	Excessive medium viscosity	High-viscous media cannot be delivered (see chapter "Technical data" for the limit values)
	Delivery hose has cracks or has holes the size of pin holes	Replace conveyor hose

Fault	Cause of the error	Error rectification
	Counter pressure at the injection point is too high	Reduce the counter pressure at the injection point
	Threaded fittings, ball valve or non-return valve have no passage or reduced passage	Re-establish flow-through: clean or replace affected fittings
	Air in the pump chamber	Vent the pump
Fluid container runs empty autonomously	Exit point of the fluid is lower than the fluid level in the container	Place the fluid container lower or the exit point higher

12 Cleaning**12.1 Safety instructions****Attention****Pump damage due to hardening, crystallising media!**

- When pumping fluids that contain solids that harden, crystallise, or that can corrode pump materials due to chemical or physical properties, the pump must be cleaned before longer standstill periods!
 - A longer standstill period is defined depending on the previously pumped medium and the change of its aggregate state from fluid to solid.
 - The definition is the responsibility of the owner and must be complied with in any case to avoid pump damage.
-

1. Only clean the pump with a cleaning agent that is suitable for the pump material and the conveyed material.
Water or solvents may be suitable.
Liquid and solid detergents must not exceed a temperature of 65 °C.
2. Connect the suction pipe connection with the detergent.
3. Connect the media outlet to a suitable container.
4. Pump the cleaning agent until all residues are detached from the pump.
5. Completely empty the pump.
6. To do this, pull the suction hose out of the cleaning agent far enough that air is suctioned in.
7. One cleaning agent no longer comes out of the outlet, disconnect the media outlets of the pump completely.
8. Svivel the pump 90° to completely drain it so that the pump base is facing up.

► Note

In the case of shutdown and placing in storage a complete emptying of the pump is necessary because the cleaning liquid may accelerate the ageing of the pump diaphragm.

9. Operate the pump with compressed air pressure of approx. 1 bar.
10. During that move the pump slightly back and forth until the remnant as all run out.
11. Clean the outer parts of the pump.

Cleaning before decommissioning

1. Clean and empty the pump as described in the preceding paragraph.
2. Replace the pump the latest one year after storage at the latest because it is subject to normal ageing and to ensure a safe and reliable operation of the pump.

Extreme storage conditions can accelerate the ageing process.

13 Maintenance

13.1 Safety instructions

WARNING

Personnel are in danger due enclosed compressed air and pressurised medium!

- Do not service or clean the pump, hoses and the outlet valve for the compressed air while the system is pressurised.
 - Before performing tasks on the pump de-pressurise the pneumatic section and the fluid section.
 - Secure against unintentional restart.
 - Shut off the compressed air supply and wait until the residual pressure is dissipated via the outlet valve for the compressed air.
 - Empty the pump before replacing components.
-

WARNING

Hazard for personnel due to spraying fluids (media)!

- Ensure that the material hoses and other components can withstand the fluid pressure generated by this pump.
 - Check the pump for damage or wear on a regular basis.
 - Ensure that the pneumatic valve, the outlet area for the compressed air and the suction side and pressure side are clean and functioning effectively for the medium.
 - Depressurise the pump before dismantling. Under some circumstances, a slight residual pressure may still be present in the pressure chamber causing the medium to eject.
 - For dismantling tasks on the pump comply with the information in the safety data sheets of the previously pumped medium.
-

WARNING

Personnel are in danger due to improper installation!

- Installation tasks must only be executed by trained personnel.
 - Wear personal protective equipment (PSA).
-

 **CAUTION****Personnel are in danger due to inadequate lighting!**

- Only perform installation tasks on the pump in an adequately illuminated and air-conditioned environment.

The double diaphragm pump is resistant to wear except for high-pressure diaphragm. The quality of the compressed air supply, the characteristics of the pumped media (such as abrasiveness, viscosity, etc.) and the operating conditions can negatively influence the service life of the pump.

Consequently we recommend regular inspection of the pump and the pump valve.

Nevertheless, should a fault occur, or if the delivery capacity decreases, you can perform the following tasks:

- Replace the high-pressure diaphragm
- Clean or replace the media check valves
- Replace the seals
- Clean and grease the pneumatic valve

13.2 Maintenance schedule

Prepare maintenance plan on the basis of the service life of the pump.

Such a maintenance plan with maintenance intervals is particularly important to reach a small operation of the pump

13.3 Timmer Service

We recommend having Timmer Service perform all recurring maintenance tasks, particularly for the entire pneumatic unit.

Timmer offers a comprehensive service concept in this regard.

14 Decommissioning

14.1 Safety instructions

WARNING

Personnel are in danger due to improper installation!

- Installation tasks must only be executed by trained personnel.
 - Wear personal protective equipment (PSA).
-

CAUTION

Health impairment due to contact with harmful media!

- Only perform cleaning, repairs, troubleshooting and fault rectification in which the possibility of contact with the medium cannot be excluded, if beforehand you have put on the appropriate personal protective equipment PSA (at least protective clothing, protective gloves, protective goggles).
 - Comply with the safety data sheets of the manufacturers and the national laws and directives.
-

Shut off the compressed air supply to the pump if the system will not be used for a longer period.

15 Replacing components

15.1 Safety instructions

WARNING

Personnel are in danger due to improper installation!

- Installation tasks must only be executed by trained personnel.
- Wear personal protective equipment (PSA).

WARNING

Hazard for personnel due to spraying fluids (media)!

- Ensure that the material hoses and other components can withstand the fluid pressure generated by this pump.
- Check the pump for damage or wear on a regular basis.
- Ensure that the pneumatic valve, the outlet area for the compressed air and the suction side and pressure side are clean and functioning effectively for the medium.
- Depressurise the pump before dismantling. Under some circumstances, a slight residual pressure may still be present in the pressure chamber causing the medium to eject.
- For dismantling tasks on the pump comply with the information in the safety data sheets of the previously pumped medium.

WARNING

Personnel are in danger due enclosed compressed air and pressurised medium!

- Do not service or clean the pump, hoses and the outlet valve for the compressed air while the system is pressurised.
- Before performing tasks on the pump de-pressurise the pneumatic section and the fluid section.
- Shut off the compressed air supply and wait until the residual pressure is dissipated via the outlet valve for the compressed air.
- Empty the pump before replacing components.

CAUTION

Personnel are in danger due to inadequate lighting!

- Only perform installation tasks on the pump in an adequately illuminated and air-conditioned environment.

Health impairment due to contact with harmful media!

- Only perform cleaning, repairs, troubleshooting and fault rectification in which the possibility of contact with the medium cannot be excluded, if beforehand you have put on the appropriate personal protective equipment PSA (at least protective clothing, protective gloves, protective goggles).
- Comply with the safety data sheets of the manufacturers and the national laws and directives.

Attention

Pump damage due to incorrect tightening torque of the housing screws!

- The prescribed tightening torque for the cylinder screws of the housing cover is 20Nm.
- To prevent damage and leaks of the pump, the value must be complied with.
- Use a calibrated torque wrench.

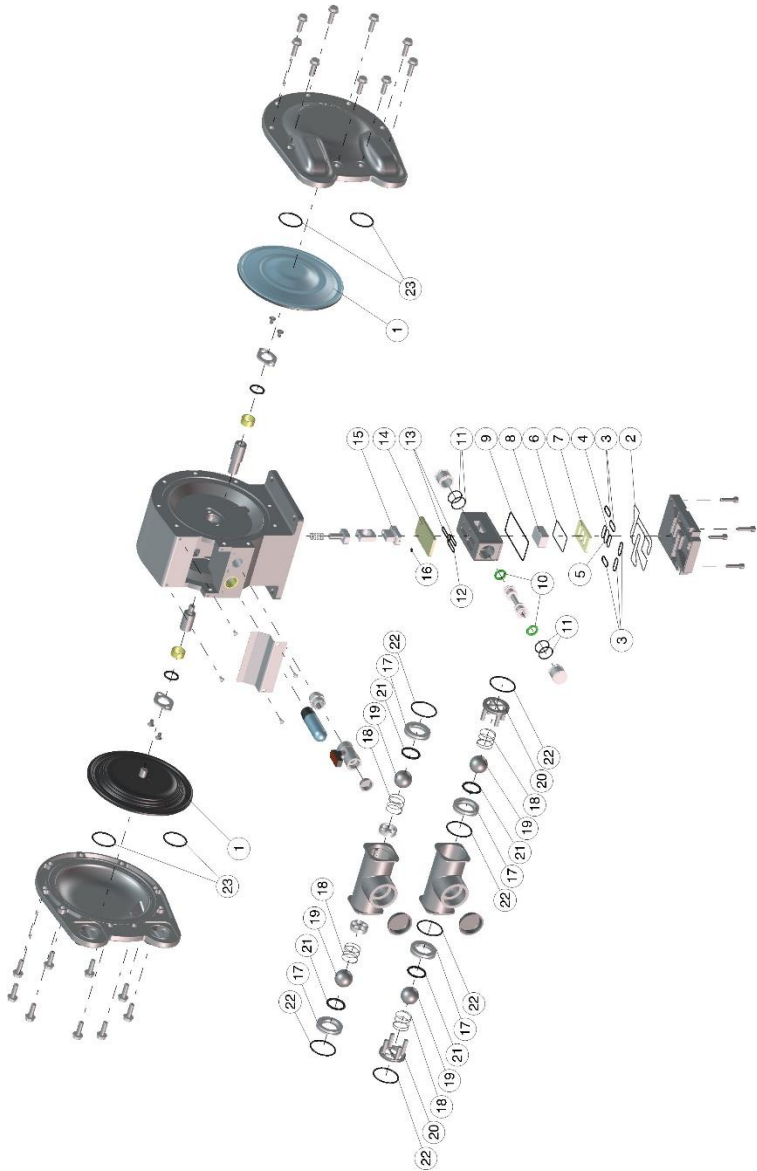
15.2 Exploded-view drawing


Fig. 3: Exploded-view drawing

15.3 Replacing the diaphragm

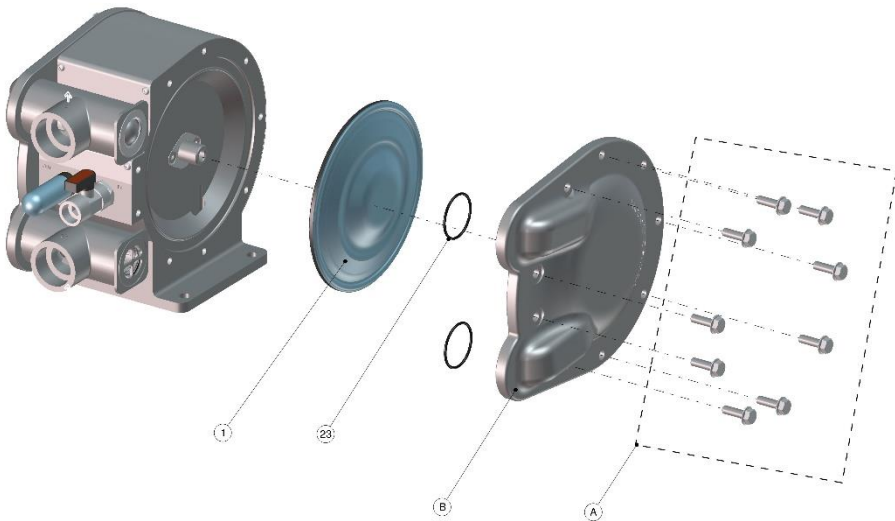


Fig. 4: Replacing the diaphragm

► Note

- When changing the diaphragm, a change of support discs is imperative because due to the high load the support disc has only a limited lifetime.
 - Timmer GmbH disclaims all warranties if the diaphragm is changed without changing the support disc.
1. loosen the hexagon head screws (A) on one of the housing covers (B) and remove the housing cover (B)
 2. Remove the diaphragm (1) from the piston rod by turning it counterclockwise.
 3. screw the new diaphragm (1) tightly onto the piston rod by turning it clockwise
Mount the housing cover (B) with the hexagon head screws (A).
Note the O-rings whose grooves are located in the cover.
 5. tighten the hexagon screws crosswise with a torque of 20 Nm
 6. repeat the procedure on the other side of the diaphragm.

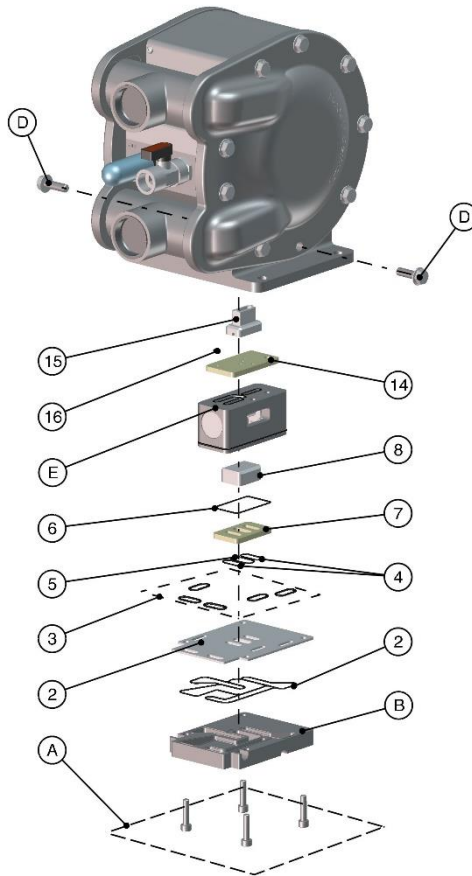
15.4 Maintenance of the pneumatics


Fig. 5: Maintenance of the pneumatics

1. Loosen the hexagonal head screws (A) on the base plate (B) and remove the base plate (B)
Remove the gasket (2), the intermediate plate (C), the O-rings (4) and (5), the gasket (3), the ceramic plate (7), the O-ring (6) and the main valve slide (8) one after the other.
3. Loosen the hexagonal screws (D) and take the pneumatic valve (E) out of the pump housing.

15.4.1 Dismantling of the pneumatic valve

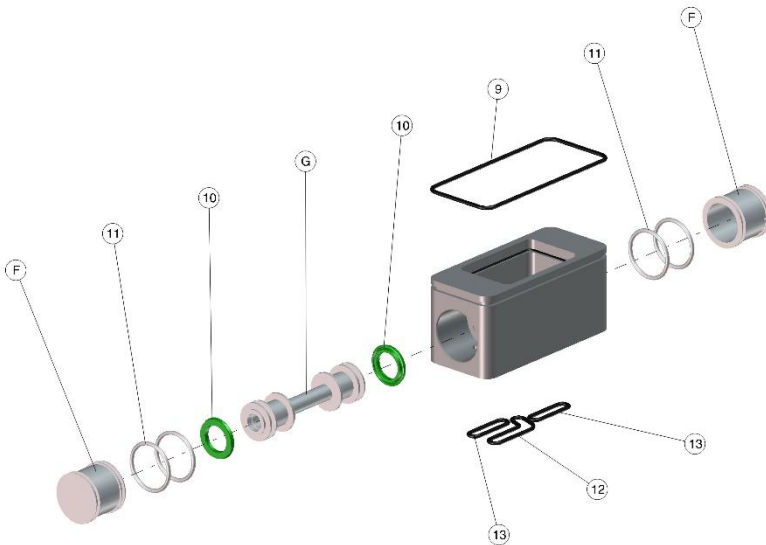


Fig. 6: Dismantling of the pneumatic valve

1. Take out the O-rings (11), (12) and (13) from the grooves in the pneumatic valve block (E).
2. Remove the covers (F) and O-rings (9).
3. Take out the slide (G) with the piston seals (10) from the pneumatic valve block (E).
4. Clean the components using a suitable cleaning agent!
First check the media compatibility!
5. Check the components, especially the O-rings and replace any defective parts.

15.4.2 Mounting the pneumatic valve

1. Place the O-rings (16) in the groove of the centre piece of the pump.
The O-ring will better maintain its position if coated in grease.
2. Place the control valve slide (15) with the bevelled side forward into the centrepiece of the double diaphragm pump. The groove of the slide must engage in the groove of the carrier (H).

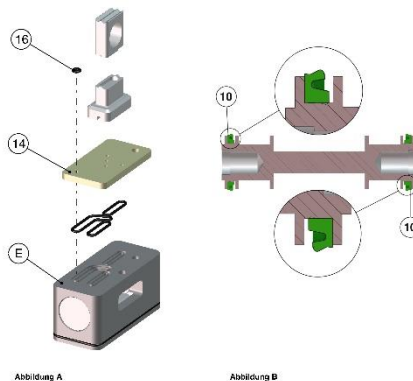


Fig. 7: Position of the ceramic plate

3. Place the ceramic plate (14) in the centrepiece of the pump so that a hole aligns with the O-ring (16) (see Figure A).
4. Assemble the pneumatic valve block (E) in reverse order.
5. Grease the seals and O-rings before assembly (e.g. with Fuchs® Renolit Unitemp 2) and avoid any kind of damage to the seals and O-rings during assembly.
Grease particularly the raceway of the piston seals (10) in the covers (F).
6. Mount the piston seals (10) on the slide (G) as shown in diagram B.
7. Place the slide (G) in the pneumatic valve block (E).
8. Place the O-ring (11) into the outer groove in the pneumatic valve block (E).
9. Insert the O-rings (12) and (13) into the groove of the pneumatic valve block (E).

Replacing components

During assembly, pay attention that the O-rings do not jump out of the grooves and are damaged.

10. Insert the mounted pneumatic valve block (E) into the centrepiece of the pump. The mounting direction is clearly shown in figure A.
11. Place the main valve slide (8) with the closed side forward into the pneumatic valve block (E). The main valve slide (8) must be inserted so that slide (G) is able to move it.
12. Place the O-ring (6) in the pneumatic valve block (E).
Pay attention to correct assembly (the side without the O-ring groove first).
13. Place the O-rings (3), (4) and (5) into the grooves provided in the centrepiece of the double diaphragm pump.
Ensure that the O-rings are not damaged and do not pop out.
14. Place the ceramic plate (17) into the pneumatic valve block (F).
Pay attention to correct assembly (the side with the large O-ring (9) first).
15. Place the O-rings (5) and (6) into the grooves provided in the centrepiece of the pump.
Ensure that the O-rings are not damaged and do not pop out.
16. Place the intermediate plate (C) in the centrepiece of the pump.
17. Equip the plate (B) with the seal (2) and place the plate (B) in the centrepiece of the pump.
18. Screw the plate (B) tight using the socket head screws (A).
The socket head screws are to be evenly tightened to a torque of 12 Nm.

15.5 Replacing the ball valves and suction pipes

► Note

The design of the media valves of the pump PTI-MEM1150 is shown at the end of the Operation Manual.

The pumps can be clearly identified by the item number on the rating plate!

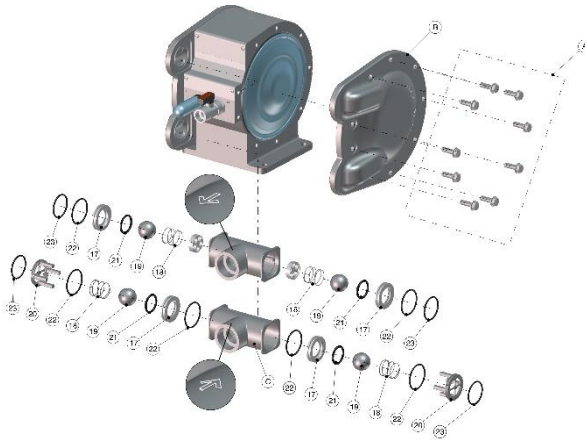


Fig. 8: Replacing the ball valves and suction pipes

1. Undo the hexagonal head set screws (A) on one of the housing covers (B) and remove the housing cover (B).
2. Take out the suction pipe (C) and the discharge pipe (D) with the O-rings (23) from the pump.
3. Remove the suction pipe (C) and discharge pipe (D) as per the drawing.
4. Clean the components using a suitable cleaning agent
First check the media compatibility!
5. Check the components, especially the O-rings, for damage and wear.
Replace defective components.
6. Assemble the valve seats with valve ball and O-ring in the reverse order.

► Hinweis

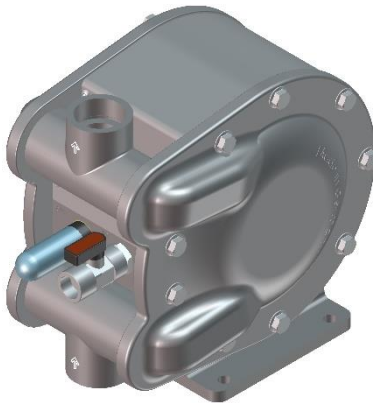
Replacing components

Do not interchange top and bottom valve!

Observe the mounting direction of the valve seats (17) in accordance with the drawing! The larger inner bevel of the valve seat (17) must be pointing towards the ball!

7. Place the O-rings (23) in the grooves of the pump cover (B).
8. Mount the suction pipe (C) and the outlet pipe (D).
Make sure you observe the flow direction marking.
8. Mount the housing cover (B) using the hexagonal head set screws (A).
The hexagonal head set screws are to be evenly tightened to a torque of 20 Nm.

Alternative suction and discharge pipe positions



The positions of the suction and discharge pipes can be varied by rotating the pipes during assembly. The possible positions are shown on the drawing. Make sure the suction and discharge pipes are correctly positioned. The arrows identify the direction of flow!

16 Disposal**16.1 Return**

Please send the pump to the following address:

Timmer GmbH

Dieselstraße 37

D-48485 Neuenkirchen

Germany

► Note

- Please send the pump in the original packaging to prevent transport damage.
- The pump must be flushed and the surface cleaned.
- If flushing is not possible, the media connections must be absolutely tightly closed to prevent medium leakage.
- Always enclose a safety data sheet of the last conveyed medium or flushing agent.

17 Technical data

General data	
Operating conditions	+5 ... +40 °C at a maximum relative humidity of 80 %
Maximum conveying output	approx. 150 l/min (at 6 bar, outlet open, water)
Drive	Pneumatic
Compression ratio	1 : 1
Liquid connections	1 1/4" BSP thread
Operating pressure	Maximum 8 bar compressed air, filtered acc. to DIN ISO 8573
Compressed air connection	½" BSP thread
Air connection	Minimum diameter: 13 mm, inner
Suction height, dry	Maximum 4 m
Weight	< 15 kg
Maximum viscosity of conveyed medium	approx. 15,000 mPa•s
Temperature of conveyed medium	+5 ... +65 °C
Noise level	< 68 dB(A)

Material of medium-carrying parts	
Housing	Stainless steel
Pressure pipe	Stainless steel
Diaphragm	PTFE*
Valve ball / spring	Stainless steel*
Liquid seal	FEPM*
Valve seat	Stainless steel

* Other materials available such as EPDM, PEEK, FFKM and NBR!

18 Spare parts for standard model

18.1 PTI-MEM1150

Item	Item number	Quantity	Description	
001	53503003	2	Diaphragm	Wearing part pack diaphragm Item No. 53507560
017	53507513	4	Bottom part of cage	Wearing part pack medium valves Item No. 53507562 (incl. medium seals Item No.53507563)
018	73010009	2	Spring	
019	70050014	4	Ball Ø30	
020	53507536	2	Cage (ball Ø30)	
021	70010671	4	O-ring Ø26x3.5	Wearing part pack medium seals Item No. 53507563
022	70010672	6	O-ring Ø40x2.5	
023	70010675	4	O-ring Ø36.17x2.62	

► Note

Spare parts are only available via the wearing parts packs. The packs vary depending on the selected variant. In this case the numbers of the spare parts are enclosed separately.

Only use genuine Timmer spare parts.

19 Appendix

19.1 Documentation of third-party manufacturers

Manufacturer	Designation
Sick	Operating instructions Magnetic Namur proximity sensor Stroke counter

Notizen



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