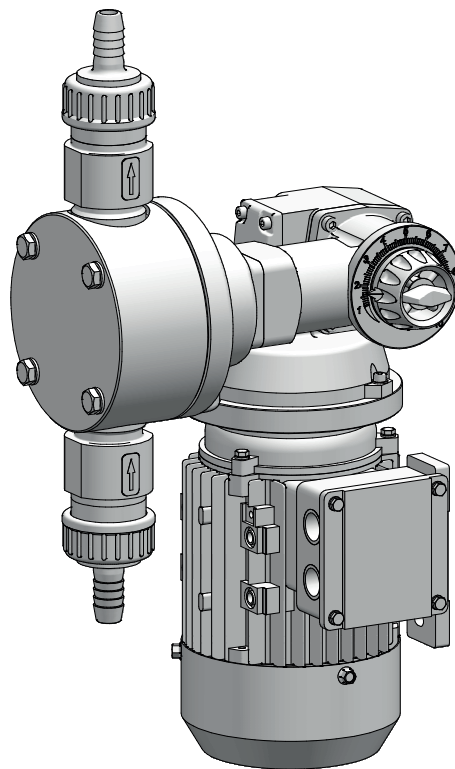


Diaphragm dosing pump **MIDIDOS C** Operating instructions



Read the operating manual!

The user is responsible for installation and operation related mistakes!

Table of Contents

1 Notes for the Reader	4	11.6 Disposal of old equipment	21
1.1 General non-discrimination	4	12 Maintenance	22
1.2 Explanation of the signal words	4	12.1 Maintenance intervals	22
1.3 Explanation of the warning signs	4	12.2 Lubrication	23
1.4 Identification of warnings	4	12.3 Diaphragm replacement	23
1.5 Identification of action instructions	4	12.4 Clean suction and pressure valves	23
2 Safety	5	13 Troubleshooting	25
2.1 General warnings	5	14 Spare parts	26
2.2 Hazards due to non-compliance with the safety instructions	5	15 Delivery characteristic curves	27
2.3 Working in a safety-conscious manner	6	16 EU declaration of conformity MIDIDOS C	28
2.4 Personal protective equipment	6	17 Declaration of no objection	29
2.5 Personnel qualification	6	18 Warranty claim	30
3 Intended use	8	19 Index	31
3.1 Notes on product warranty	8		
3.2 Intended purpose	8		
3.3 Principles	8		
3.4 Prohibited dosing media	8		
3.5 Foreseeable misuse	8		
4 Product description	10		
4.1 Properties	10		
4.2 Scope of delivery	10		
4.3 Structure of the dosing pump	10		
4.4 Function description	10		
4.5 Rating plate	10		
5 Technical data	11		
5.1 Delivery capacity data	11		
5.2 Operating conditions and limits	11		
5.3 Other data	12		
5.4 Motor data	12		
6 Dimensions	13		
7 Installation	14		
7.1 Installation location	14		
7.2 Mounting points	14		
8 Hydraulic installations	15		
8.1 Design of the system	15		
8.2 System piping	15		
8.3 Suction and pressure valves	15		
8.4 Connecting a leakage drain	16		
8.5 Hydraulic accessories	16		
9 Electrical installation	18		
9.1 Circuit diagrams of the drive motor	18		
10 Control	19		
11 Operation	20		
11.1 Start-up	20		
11.2 Shut-down	20		
11.3 Shutting down in an emergency	21		
11.4 Storage	21		
11.5 Transportation	21		

1 Notes for the Reader

These Operating instructions contain information and behaviour rules for safe and designated operation of the dosing pump MIDIDOS C.

Observe the following principles:

- Read the entire operating manual prior to starting-up the device.
- Ensure that everyone who works with or on the dosing pump has read the operating instructions and follows them.
- Keep the operating instructions for the entire service life of the dosing pump.
- Pass on the operating instructions to any subsequent owner of the dosing pump.

1.1 General non-discrimination

In this operating manual, only the male gender is used where grammar allows gender allocation. The purpose of this is to make the text easy to read. Men and women are always referred to equally. We would like to ask female readers for understanding of this text simplification.

1.2 Explanation of the signal words






Different signal words in combination with warning signs are used in this operating manual. Signal words illustrate the gravity of possible injuries if the risk is ignored:

Signal word	Meaning
DANGER	Refers to imminent danger. Ignoring this sign may lead to death or the most serious injuries.
WARNING	Refers to a potentially hazardous situation. Failure to follow this instruction may lead to death or severe injuries.
CAUTION	Refers to a potentially hazardous situation. Failure to follow this instruction may lead to minor injury or damage to property.
PLEASE NOTE	Refers to a danger which, if ignored, may lead to risk to the machine and its function.

Tab. 1: Explanation of the signal words

1.3 Explanation of the warning signs

Warning signs represent the type and source of a danger:

Warning sign	Type of danger
	General danger zone
	Danger of electric shock
	Danger of caustic or other burns
	Danger of automatic start up
	Danger of damage to machine or functional influences

Tab. 2: Explanation of the warning signs

1.4 Identification of warnings

Warnings are intended to help you recognise risks and avoid negative consequences.

This is how warnings are identified:

Warning sign	SIGNAL WORD
Description of danger	
Consequences if ignored.	
⇒ The arrow signals a safety precaution to be taken to eliminate the danger.	

1.5 Identification of action instructions

This is how pre-conditions for action are identified:

- ✓ Pre-condition for action which must be met before taking action.
- ✘ A resource such as a tool or auxiliary materials required to perform the operating instructions.

This is how instructions for action are identified:


- ➔ Separate step with no follow-up action.
- 1. First step in a series of steps.
- 2. Second step in a series of steps.
 - ▶ Result of the above action.
- ✓ **Action completed, aim achieved.**


2 Safety


2.1 General warnings


The following warnings are intended to help you to eliminate the dangers that can arise while handling the dosing pump. Risk prevention measures always apply regardless of any specific action.


Safety instructions warning against risks arising from specific activities or situations can be found in the respective sub-chapters.


	DANGER
<p>Mortal danger from electric shock!</p> <p>Wrongly connected or located cables or damaged ones can injure you.</p> <ul style="list-style-type: none"> ⇒ Only connect the device to an earthed power supply. ⇒ Replace damaged cables without delay. ⇒ Do not use extension cables. ⇒ Do not bury cables. ⇒ Secure cables to avoid being damaged by other equipment. 	

	WARNING
<p>Danger from unsuitable materials</p> <p>The materials of the dosing pump and hydraulic parts of the system must be suitable for the dosing medium that is used. Should this not be the case, the dosing media may leak.</p> <ul style="list-style-type: none"> ⇒ Make sure that the materials you are using are suitable for the dosing medium. ⇒ Make sure that the lubricants, adhesives, sealants, etc. that you use are suitable for the dosing medium. 	

	WARNING
<p>Danger of automatic start up!</p> <p>After connecting the mains supply, residual dosing media in the dosing head can spray out.</p> <ul style="list-style-type: none"> ⇒ Before connecting the mains supply, connect the dosing lines. ⇒ Check that all the screw connections have been tightened correctly and are leak-proof. 	

	WARNING
<p>Caustic burns or other burns through dosing media!</p> <p>While working on the dosing head, valves and connections, you may come into contact with dosing media.</p> <ul style="list-style-type: none"> ⇒ Use sufficient personal protective equipment. ⇒ Rinse the dosing pump with a liquid (e.g. water) which does not pose any risk. Ensure that the liquid is compatible with the dosing medium. ⇒ Release pressure in hydraulic parts. ⇒ Never look into open ends of plugged pipelines and valves. 	

	CAUTION
<p>Danger when changing the dosing medium!</p> <p>Changing the dosing media can provoke unexpected reactions, damage to property and injury.</p> <ul style="list-style-type: none"> ⇒ Clean the dosing pump and the system parts in contact with the media thoroughly before changing the dosing medium. 	

	CAUTION
<p>Increased risk of accidents due to insufficient qualification of personnel!</p> <p>Dosing pumps and their accessories may only be installed, operated and maintained by personnel with sufficient qualifications. Insufficient qualification will increase the risk of accidents.</p> <ul style="list-style-type: none"> ⇒ Ensure that all action is taken only by personnel with sufficient and corresponding qualifications. ⇒ Prevent access to the system for unauthorised persons. 	

2.2 Hazards due to non-compliance with the safety instructions

Failure to follow the safety instructions may endanger not only persons, but also the environment and the device.

The specific consequences can be:

- Failure of vital functions of the dosing pump and the system
- Failure of required maintenance and repair methods
- Danger for individuals through dangerous dosing media
- Danger to the environment caused by substances leaking from the system

2.3 Working in a safety-conscious manner




Besides the safety instructions specified in this operating manual, further safety rules apply and must be followed:

- Accident prevention regulations
- Safety and operating provisions
- Safety provisions for handling dangerous substances (mostly the safety data sheets to dosing media)
- Environmental protection provisions
- Applicable standards and legislation

2.4 Personal protective equipment

Based on the degree of risk posed by the dosing medium and the type of work you are carrying out, you must use corresponding protective equipment. Read the Accident Prevention Regulations and the Safety Data Sheets to the dosing media find out what protective equipment you need.

You will require the minimum of the following personal protective equipment:

Personal protective equipment required	
	Protective goggles
	Protective clothing
	Protective gloves

Tab. 3: Personal protective equipment required

Wear the following personal protective equipment when performing the following tasks:

- Commissioning
- Working on the dosing pump while running
- Shut-down
- Maintenance work
- Disposal

2.5 Personnel qualification

Any personnel who work on the dosing pump must have appropriate special knowledge and skills.

Anybody who works on the dosing pump must meet the conditions below:

- Attendance at all the training courses offered by the owner
- Personal suitability for the respective activity
- Sufficient qualification for the respective activity
- Training in handling of the dosing pump
- Knowledge of safety equipment and the way this equipment functions
- Knowledge of this operating manual, particularly of safety instructions and sections relevant for the activity
- Knowledge of fundamental regulations regarding health and safety and accident prevention

All persons must generally have the following minimum qualification:

- Training as specialists to carry out work on the dosing pump unsupervised
- Sufficient training that they can work on the dosing pump under the supervision and guidance of a trained specialist.

These operating instructions differentiate between these user groups:

2.5.1 Specialist staff

Thanks to their professional training, knowledge, experience and knowledge of the relevant specifications, specialist staff are able to perform the job allocated to them and recognise and/or eliminate any possible dangers by themselves.

2.5.2 Trained electricians

Due to their professional training, knowledge and experience as well as knowledge of specific standards and provisions, trained electricians are able to do the electrical work assigned to them and to recognise and avoid any potential dangers by themselves.

They are specially trained for their specific working environment and are familiar with relevant standards and provisions.

They must comply with the legally binding regulations on accident prevention.

2.5.3 Trained electricians with additional qualification for explosion protection

Trained electricians with additional qualification for explosion protection fulfil the criteria to act as a competent person to meet all the special requirements needed when working in explosive risk areas.

They are specially trained for their work environment in explosive risk areas and know all the relevant standards and regulations.

Above all, they have the required specialist knowledge about explosion protection like, for example, ignition protection classes, flash points, density ratios, zoning, device categories, temperature classes etc.

2.5.4 Trained persons

Trained persons have received training from the operator about the tasks they are to perform and about the dangers stemming from improper behaviour.

In the table below you can check what qualifications are the pre-condition for the respective tasks. Only people with appropriate qualifications are allowed to perform these tasks!

Qualification	Activities
Specialist staff	<ul style="list-style-type: none"> ■ Assembly ■ Hydraulic installations ■ Maintenance ■ Repairs ■ Commissioning ■ Taking out of operation ■ Disposal ■ Fault rectification
Trained electricians	<ul style="list-style-type: none"> ■ Electrical installation ■ Installing the electric servomotor ■ Rectifying electrical faults
Trained electricians with additional qualification for explosion protection	<ul style="list-style-type: none"> ■ Electrical installation in explosive risk areas ■ Fault rectification in explosive risk areas
Trained persons	<ul style="list-style-type: none"> ■ Storage ■ Transportation ■ Control ■ Fault rectification

Tab. 4: Personnel qualification

3 Intended use

3.1 Notes on product warranty

Any non-designated use of the product can compromise its function or intended protection. This leads to invalidation of any warranty claims!

Please note that liability is on the side of the user in the following cases:

- The dosing pump is operated in a manner which is not consistent with these operating instructions, particularly safety instructions, handling instructions and the section "Intended Use".
- if people operate the product who are not adequately qualified to carry out their respective activities.
- No original spare parts or accessories are used.
- Unauthorised changes are made to the device.
- The user uses different dosing media than those indicated in the order.
- The user does not use dosing media under the conditions agreed with the manufacturer such as modified concentration, density, temperature, contamination, etc.

3.2 Intended purpose

The dosing pump MIDIDOS C is intended for the following purpose: the conveying and dosing of liquids.

3.3 Principles

- Before delivery, the manufacturer inspected the dosing pump and operated it under specific conditions (with a specific dosing medium with a specific density and temperature, with specific pipe dimensions, etc.) Since these conditions differ at every location of usage, the delivery capacity of the dosing pump should be measured by gauging it at the operating company's installation. For details on the approximate values and the capacity of the dosing pump, refer to the chapter 15 "Delivery characteristic curves" on page 27.
- Comply with the information regarding the operating and environmental conditions (see chapter "Technical data").
- Any restrictions regarding the viscosity, temperature and density of dosing media must be followed. You must only use dosing media at temperatures above freezing point or below the boiling point of the respective medium.
- The materials of the dosing pump and hydraulic parts of the system must be suitable for the dosing medium that is used. In this connection, note that the resistance of these components can change in dependence on the temperature of the media and the operating pressure.



Information on the suitability of materials combined with different dosing media can be found in the Compatibility Chart of the manufacturer.

The information in this resistance list is based on information from the material manufacturers and on expertise obtained from handling the materials.

As the durability of the materials depends on many factors, this list only constitutes initial guidance on selecting material. In all cases, test the equipment with the chemicals you use under operating conditions.

- The dosing pump is not intended for outdoor use unless appropriate protective measures have been taken.
- Avoid leaks of liquids and dust into the casing and avoid direct exposure to sunlight.
- You must never operate dosing pumps in a potentially explosive atmosphere if they do not have corresponding nameplates or an appropriate EC Declaration of Conformity for potentially explosive atmospheres.

3.4 Prohibited dosing media

The dosing pump must not be used for these media and substances:

- Gaseous media
- Radioactive media
- Solid substances
- Flammable media, if adequate protective measures are not taken
- All other media that are not suitable for delivery using this dosing pump

3.5 Foreseeable misuse

Below, there is information about the applications of the dosing pump or associated equipment that are not considered to be intended use. This section is intended to allow you to detect possible misuse in advance and to avoid it.

Foreseeable misuse is assigned to the individual stages of the product lifetime:

3.5.1 Incorrect assembly

- Unstable or unsuitable bracket
- Dosing pump bolted wrongly or loosely

3.5.2 Incorrect hydraulic installation

- Suction and pressure lines dimensioned incorrectly
- Unsuitable connection of the pipes due to wrong material or unsuitable connections
- Suction and pressure lines mixed-up
- Damage to threads due to them being tightened too much
- Bending of pipelines
- No free return flow of the pressure relief valve
- Excessive demand due to the pressure differences between the suction and pressure valves
- Through-suction at installation without back-pressure valves
- Damage due to undamped acceleration mass forces
- Exceeding the admissible pressure on the suction and discharge sides
- Using damaged parts

3.5.3 Incorrect electrical installation

- Connecting the mains voltage without a protective earth
- Unsecured mains or one that does not conform to standards
- Not possible to immediately or easily disconnect the power supply
- Wrong connecting cables for mains voltage
- Dosing pump accessories connected to wrong sockets
- Diaphragm monitoring not connected or defective
- Protective earth removed

3.5.4 Incorrect start-up

- Start-up with damaged system
- Shut-off valves closed at commissioning
- Closed suction or pressure line, e.g. due to blockages
- Personnel was not informed before the start-up
- System was recommissioned after maintenance without all the protective equipment and fixtures, etc. being reconnected.
- Inadequate protective clothing or none at all

3.5.5 Incorrect operation

- Protective equipment not functioning correctly or dismantled
- Modification of the dosing pump without authority
- Ignoring operational disturbances
- Elimination of operational disturbances by personnel without adequate qualifications
- Deposits in the dosing head due to inadequate purging, particularly with suspensions
- Bridging the external fuse
- Operation made more difficult due to inadequate lighting or machines that are difficult to access
- Operation not possible due to dirty or illegible display of the dosing pump
- Delivery of dosing media for which the system is not designed
- Delivery of particulate or contaminated dosing media
- Inadequate protective clothing or none at all

3.5.6 Incorrect maintenance

- Carrying out maintenance during ongoing operation
- Carrying out work that is not described in the operating manual
- No adequate or regular inspection of correct functioning
- No replacement of damaged parts or cables with inadequate insulation
- No securing against reactivation during maintenance work
- Using cleaning materials that can cause reactions with the dosing media
- Inadequate cleaning of the system
- Unsuitable purging medium
- Unsuitable cleaning materials
- Detergents left in system parts
- Using unsuitable cleaning equipment
- Using the wrong spares or lubricants
- Contaminating the dosing medium with lubricant
- Installing spare parts without following the instructions in the operating manual
- Blocking venting orifices
- Pulling off sections of the plant
- Contamination at installation without a dirt trap
- Mixing up the valves
- Mixing up the sensor lines
- Not reconnecting all the lines
- Damaging or not installing all the seals
- Not renewing seals
- Not paying attention to safety data sheets
- Inadequate protective clothing or none at all

3.5.7 Incorrect decommissioning

- Not completely removing the dosing medium
- Dismantling lines while the dosing pump is running
- Device not disconnected from the power supply
- Using the wrong dismantling tools
- Inadequate protective clothing or none at all

3.5.8 Incorrect disposal

- Incorrect disposal of dosing media, operating resources and other materials
- No labelling of hazardous substances

4 Product description

4.1 Properties

MIDIDOS C is a conventional diaphragm dosing pump designed for the targeted addition of chemicals.

They are characterized by the following properties:

- Single dosing pump with the dosing head mounted on the left-hand side
- Non-leaking
- Output range from 24 to 120 l/h
- The motor is connected directly to the terminal box.
- Stroke length manually adjustable between 0% and 100%
- Three-phase motor as electric drive

4.2 Scope of delivery

Please compare the delivery note with the scope of delivery. The following items are part of the scope of delivery:

- Dosing pump MIDIDOS C
- Operating instructions
- Inspection report and test certificate (optional)
- Accessory kit (optional)

4.3 Structure of the dosing pump

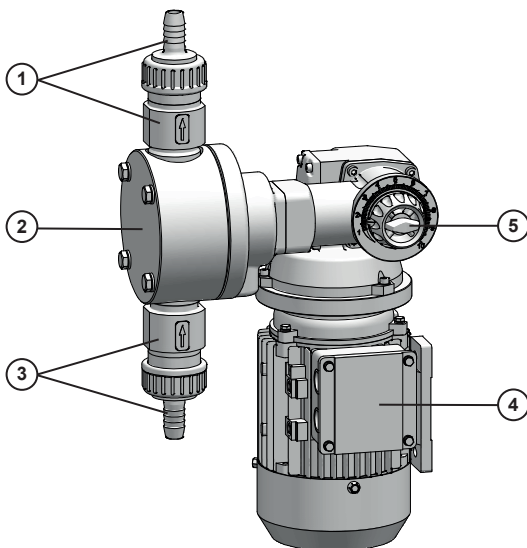


Fig. 1: Dosing pump overview MIDIDOS C

No.	Description
1	Valve and connection on the discharge side
2	Dosing head
3	Valve and connection on the suction side
4	Drive motor
5	Stroke length adjustment

Tab. 5: Designation of components

4.4 Function description

Dosing pumps are positive displacement pumps. They are used if precisely defined delivery of a medium is necessary. A constant volume per stroke or time is delivered.

The system delivers or meters the dosing medium by means of a repeated sequence of suction strokes followed by pressure strokes. This results in a pulsing flow.

If the dosing pump is in the suction stroke phase, the diaphragm is pulled into the rear final position. Due to the resulting vacuum in the dosing head, the pressure valve closes, the suction valve opens and dosing medium flows from the suction line into the dosing head.

If the dosing pump is in the pressure stroke phase, the diaphragm is moved into the front final position. Due to the pressure in the dosing head, the suction valve closes and the dosing medium flows through the pressure valve from the dosing head into the pressurised pipe.

4.5 Rating plate

There is information on the equipment about safety or the product's way of functioning. The information must stay legible for the duration of the service life of the product.

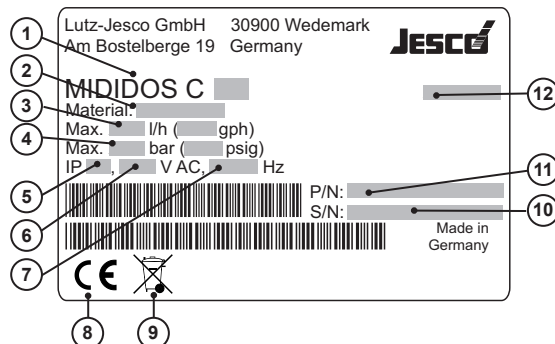


Fig. 2: Rating plate MIDIDOS C

No.	Description
1	Product name
2	Material of the dosing head/seals
3	Maximum delivery capacity
4	Maximum back pressure
5	Protection class
6	Voltage supply
7	Frequency
8	Label showing conformity with applicable European directives
9	WEEE label
10	Serial number
11	Part number
12	Month/year of manufacture

Tab. 6: Rating plate

5 Technical data

Please note that some of this data only represents guide values. The actual capacity of a dosing pump depends on various factors. For approximate values of the delivery capacity at different pressures, refer to chapter “15 Delivery characteristic curves” on page 27.

5.1 Delivery capacity data

Details			MIDIDOS C size			
			24	48	72	120
Delivery capacity at max. backpressure	l/h	50 Hz	24	48	80	114
		60 Hz	29	57	96	136
	ml/stroke	8.5				20.8
Max. delivery pressure	for 1ph-operation	bar	10	5	3	2
	for 3ph-operation	bar	10		6	4
Max. stroke frequency		1/min	48	96	148	96
Suction lift for non-gassing media (with a filled suction line)		mWs	7			3

Tab. 7: Delivery capacity data

5.2 Operating conditions and limits

Information		MIDIDOS C (all sizes)
Approved ambient temperature	°C	5 – 45 (with PVC components 5 – 40)*
Relative humidity	%	max. 90
Max. sound pressure level	dB(A)	57 – 65
Max. supply pressure	mbar	500
Viscosity limits	mPa·s	300**/1000***
Adjustable dosing range	%	0 – 100

Tab. 8: Operating conditions and limits

* Use of the dosing pump at ambient temperatures below 5 °C must be checked individually. In such cases, please contact the manufacturer.

** With a viscosity of ~300 mPa·s and above, you must use spring-loaded valves.

*** If the viscosity is above 1000 mPa·s, this must be checked individually and the stroke frequency must be between 50 and 100 strokes/min.

5.2.1 Approved media temperature

Information		MIDIDOS C (all sizes)
Dosing head made of PVC	°C	0 – 35
Dosing head made of PP	°C	0 – 60
Dosing head made of PVDF	°C	0 – 60
Dosing head made of stainless steel (1.4571)	°C	0 – 80

Tab. 9: Approved media temperature

5.3 Other data

Details		MIDIDOS C size			
		24	48	72	120
Membrane diameter	mm	64			90
Nominal size of the double ball valves		DN6			DN10
Protection class		IP55			

Tab. 10: Other data MIDIDOS C

5.4 Motor data

The motor data is specified on the motor identification plate.

6 Dimensions

All dimensions in mm

The dimensions in brackets apply to the MIDIDOS C 120.

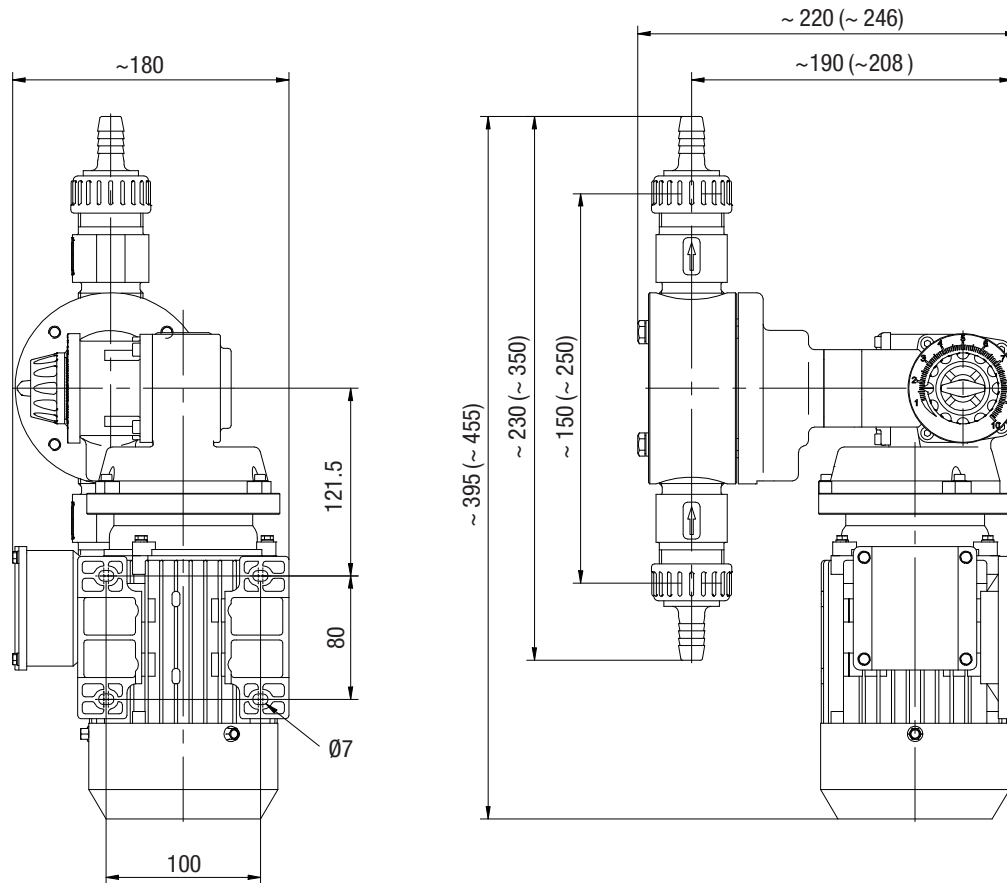


Fig. 3: Dimensional drawing MIDIDOS C

7 Installation



DANGER

Mortal danger from electric shock!

Electrically conductive liquid can enter pump housings, cable screw connections and mains connectors.

- ⇒ Make sure that all protective measures comply at least with the requirements of protection class IP65.
- ⇒ Always set up the dosing pump such that water cannot enter the housing.



CAUTION

Danger of personal injury and material damage!

A dosing pump that is difficult to access represents a danger due to incorrect operation and faulty maintenance.

- ⇒ Install the dosing pump such that it is accessible at all times.



PLEASE NOTE

Locking of threads

Stainless steel and plastic parts (particularly those made of PVC) that are bolted together in a detachable connection (e.g. the dosing head and the valves) can lock. This makes them difficult to release.

- ⇒ Before bolting, grease the corresponding parts with a lubricant (e.g. PTFE spray). Ensure that the lubricant is compatible with the dosing medium.

- The system piping must not exert any force on the connections and valves of the dosing pump.
- To avoid dosing errors at the end of the process, the dosing pump must be locked electrically and hydraulically.

7.2 Mounting points

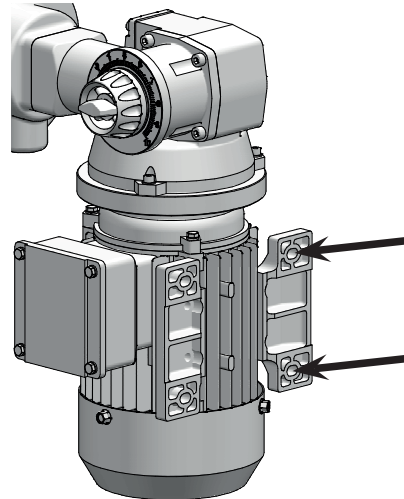


Fig. 4: Mounting points


7.1 Installation location


When installing, follow the basic principles below:


- The installation location of the dosing pump must be easily accessible by operating and service personnel.
- When installing the dosing pump below the liquid level, care must be taken to ensure that chemical leakages due to a broken diaphragm cannot cause any damage (collecting pan, leakage sensor).
- The pump can also be installed directly on the dosing container.
- The valves must be vertical: Pressure valve at top, suction valve at bottom. In this connection, pay attention to the arrow on the dosing head. The dosing head must be aligned such that the arrow points vertically upwards.
- Radiant heat from apparatus and heat exchangers must be shielded so that heat from the dosing pump can be dissipated sufficiently.
- Avoid exposure to direct sunlight.
- If the dosing pump is installed outside, provide a roof to protect it from the effects of weather.
- To ensure stability, bolt the pump to a suitable foundation.

8 Hydraulic installations

In this chapter, you will find information about the hydraulic parts of a system that you should install or that can install additionally. In many cases, you must install hydraulic accessories to be able to use all the functions that the dosing pump MIDIDOS C offers, to guarantee functional safety or to achieve a high level of dosing precision.

	WARNING
Caustic burns or other burns through dosing media!	
<p>A diaphragm rupture, blocked pressure lines or the use of material not suitable for the dosing medium can result in the discharge of dosing medium. Depending on the type and hazardousness of the dosing medium, this can result in injury.</p> <ul style="list-style-type: none"> ⇒ Wear the recommended personal protective equipment. ⇒ Make sure that the materials you are using are suitable for the dosing medium. ⇒ Make sure that the lubricants, adhesives, sealants, etc. that you use are suitable for the dosing medium. ⇒ Install a leakage drain. ⇒ Install pressure relief valves. 	

	CAUTION
Danger of personal injury and material damage!	
<p>High peak pressures can lead to piping vibrating and cause them to snap. This can result in injury from piping or escaping dosing media.</p> <ul style="list-style-type: none"> ⇒ Install pulsation dampeners. 	

	PLEASE NOTE
Damage to drives due to overloading	
<p>The pressure conditions between the suction and discharge sides must be balanced; otherwise, overloading can result. This can lead to uncontrolled dosing processes, damage to the piping and to the dosing pump.</p> <ul style="list-style-type: none"> ⇒ Ensure that the pressure on the discharge side is at least 1 bar than on the suction side. 	

8.1 Design of the system

- The dosing pumps technical data (see chapter “5 Technical data” on page 11) must be taken into account and the plant's layout must be set up appropriately (e.g. pressure loss when rating the lines with regard to their nominal diameter and length).
- The entire system and its integrated dosing pump must be designed in such a way that an escaping dosing medium (due to the failure of wearing parts such as the diaphragm, or burst hoses) does not lead to permanent damage to system parts or the premises.
- The leakage opening of the dosing head must be visible so that you

can detect a diaphragm rupture. It must be possible for the outflow from the leakage drain to be on a free downwards gradient.

- If you use hazardous dosing media, the installation must be designed such that no disproportionately high consequential damages arise due to dosing media escaping.
- To avoid dosing errors after the end of the process, the dosing pump must be locked hydraulically.
- To allow you to easily inspect the pressure conditions in the system, you should provide connections for pressure gauges close to the suction and pressure valves.

8.2 System piping

- The system piping must not exert any force on the connections and valves of the dosing pump.
- This means that steel piping should be connected to the dosing pump by means of flexible pipe sections.
- The nominal diameters of the pipework and the installed fittings should be rated the same as or greater than the nominal diameters of the dosing pump's suction and pressure valves.
- The suction line should be kept as short as possible.
- You should avoid intertwined hoses.
- Avoid loops, since air bubbles can collect.

8.3 Suction and pressure valves

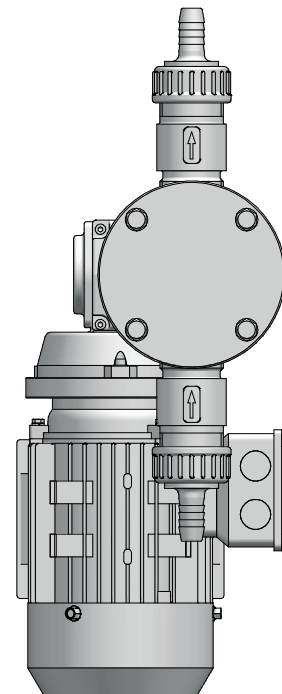


Fig. 5: Dosing head with suction and pressure valves

The suction and pressure valves are hydraulic connections to the dosing pump onto which the suction line or pressure line are attached.

These are double-ball bearing or spring-loaded valves which can only work properly when mounted in a vertical direction. The condition of the valves has a significant impact on the function and the dosing accuracy of the dosing pump.

All valves have arrows on them, these indicate the flow direction. These arrows must always point upwards.

For this reason, when connecting the dosing lines to the dosing pump, observe the alignment:

- Pressure valve above the dosing head
- Suction valve under the dosing head

8.4 Connecting a leakage drain



PLEASE NOTE

Damage to drives due to effervescent media

If a hose is connected to the leakage drain and it is routed back into the dosing tank, effervescent media can enter the drive and damage it.

- ⇒ Collect the leakage in a collecting pan.
- ⇒ As an alternative, you can route the leakage back to the dosing tank using a funnel. You should install the funnel at an adequate distance from the leakage opening.

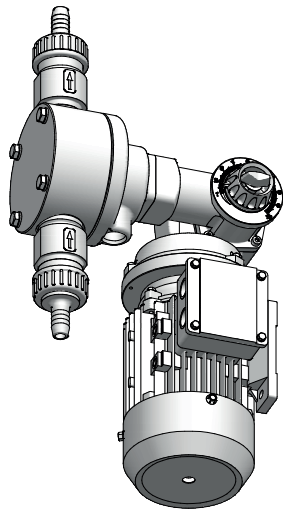


Fig. 6: Install leakage drain

Lutz-Jesco GmbH dosing pumps are produced to the highest of quality standards with a long service life. However, some parts are subject to operational wear. This is the case particularly with the diaphragms that are continuously subjected to forces during the suction and discharge strokes and to the effects of the dosing medium.

If a diaphragm ruptures, the dosing medium starts to leak. The leakage from the separating chamber must be allowed to flow downward to the collecting pan. The leakage drain pipe must never lead directly back to the medium through the tank cover, otherwise released gases may get into the pump gearbox. The leakage drain must lead downwards to a gas-free collecting tank or a collecting funnel, leaving a sufficient gap between the two. Leakage can then be returned through the funnel and through the tank cover. This makes it easier to detect any leakages at the gap to the collecting funnel.

8.5 Hydraulic accessories

The following chapter is intended to give you an overview of installation options.

Please note that these operating instructions are no substitute for the instructions supplied with the accessories in each case. The corresponding documentation supplied with the product applies to safety information and provides exact instructions on assembly.

8.5.1 Injection nozzle

If the pressure line enters a main line, it is advisable to install an injection nozzle.

Injection nozzles have three main functions:

- Dosing the medium into a main line
- Preventing flowback into the pressure line through a non-return valve

Notes on assembly:

- Double-ball injection nozzles must be installed into the main line vertically from the bottom. You can install hose and spring-loaded injection nozzles any way you like.
- With dosing media that tend to crystallize, it is advisable to carry out installation into the main line from the bottom. This prevents air bubbles from being trapped.
- Many dosing media tend to contaminate the injection nozzles, which can lead to blockages. In cases like this, it is advisable to install an injection nozzle that is easy to dismantle and block off.

8.5.2 Pressure-relief valve

Pressure relief valves have an important safety function for protecting the dosing pump and the associated pipes and fittings. The dosing pump can generate a pressure that is many times the rated one. A blocked pressure line can lead to dosing medium escaping.

An improperly high pressure can occur if:

- The shut-off valves are closed even though the dosing pump is running
- Pipes block

At an appropriate pressure, a pressure relief valve opens a bypass line and protects the system in this way from damage caused by over-pressure.

Notes on assembly:

- The line for returning dosing medium from the pressure relief valve must be routed to the dosing tank or to a collecting pan.
- The pressure in the dosing tank must not be too high so that it is possible to accommodate the returned dosing medium.
- As an alternative, the system can return dosing medium into the suction line in front of the dosing pump. In this case, there must not be a non-return valve or a foot valve in the suction line.
- You should install the pressure relief valve as close as possible to the dosing head.

8.5.3 Back-pressure valve

Back-pressure control valves are necessary if:

- There are considerably fluctuating system pressures
- The pressure on the suction side is higher than on the discharge side or if you intend to carry out dosing into depressurized lines

In cases like this, if you do not use a back-pressure valve, imprecise dosing results will occur or overloading will result. The back-pressure valve solves these problems by generating a defined, constant backpressure.

In some circumstances, a back-pressure valve is unnecessary if you use a hose injection nozzle and if the backpressure that it generates is adequate.

8.5.4 Pulsation dampener

Pulsation dampeners have the following functions:

- Damping pulsating delivery flows for processes that require low-pulsation dosing,
- Reducing the throughflow resistance with long pipelines

When installed on the suction side:

- Damping of acceleration mass forces and with this reduction of wear on the dosing pump
- Preventing cavitation (pull-off of the liquid column) due to too high acceleration

However, pulsation dampeners also have important safety functions, since they prevent pressure peaks from arising that lead to piping vibrating and cause them to snap.

This problem can occur:

- With the high amplitudes of the vibrations
- When using long pipes (the severity of the pulsation increases with the length of the pipe)
- When using rigid piping instead of elastic hoses

Notes on assembly:

- You should carry out assembly in the direct vicinity of the location where you want to damp the pressure peaks (directly in front of the suction valve or directly behind the pressure valve).
- Pulsation dampeners should be installed with throttle valves or back-pressure valves installed directly behind them. By setting the valves appropriately, you can further-optimize damping of the pulsations.
- To prevent unnecessary pipe friction losses, you should lay the connecting line straight and in accordance with the rated width of the pulsation dampener.
- You must separately fasten relatively large pulsation dampeners and ones with hose connections.
- Pipelines must not transfer any mechanical tensions onto the pulsation dampener.

8.5.5 Priming aid

Priming aids are particularly advisable:

- In the case of dosing pumps with small volumetric displacements per stroke or with low stroke length settings
- With high suction heights

- With highly dense dosing media
- At priming for the first time due to dry valves and air in the suction line and the dosing head
- In dosing systems with frequent downtimes

Further advantages resulting from priming aids:

- Preventing cavitation in the suction line
- Gas removal
- Optical dosing control with small amounts
- Smoothing of the suction flow

8.5.6 Level control

Level monitoring of suction-side feeding of the dosing medium to prevent the tank being sucked dry and to ensure that it can be topped up again in good time.

8.5.7 Dosing of suspensions

When dosing suspensions, the dosing head must be rinsed regularly to prevent depositing. To do this, you install a feed line for the rinsing medium (water) in the suction side installation.

8.5.8 Suction pressure regulator

A suction pressure regulator may be necessary if the suction-side installation of the system demonstrates a varying suction pressure or supply pressure:

- Dosing pumps that are installed above dosing tanks deliver less as the tank empties, since the suction head increases.
- Dosing pumps that are installed below dosing tanks deliver less as the tank empties, since the positive delivery pressure reduces.

Further problems that can occur:

- Greater wear on the dosing pump, e.g. diaphragm rupture due to the effects of heavy forces with particularly high tanks and high-density dosing media.
- Idling of the dosing tank in the case of a diaphragm rupture or pipe breakage
- Impermissibly high forces in the pump transmission that occur when dosing pumps receive the dosing medium directly from the pressure line
- Reduced performance or destruction of fittings due to cavitation with long suction lines

Installing a suction pressure regulator is a remedy for the problems above. The suction pressure regulator is opened by the dosing pump's suction pressure. This ensures that no dosing medium can flow if the dosing pump is not running or no vacuum can be generated following a pipe fracture.

Notes on assembly:

- When using a large suction pressure regulator, you should provide a pulsation dampener on the suction side.

9 Electrical installation



DANGER

Mortal danger from electric shock!

If there is an electrical accident, you must disconnect the dosing pump from the mains as quickly as possible.

⇒ Install an emergency stop switch or integrate the dosing pump into the plant safety concept.



CAUTION

Danger of automatic start up!

The dosing pump does not have an ON/OFF switch and may start to pump as soon as it is connected to the mains supply. This means that dosing medium can escape. Depending on the type and hazardousness of the dosing medium, this can result in damage to property or to injury.

⇒ Install an emergency stop switch or integrate the dosing pump into the plant safety concept.



PLEASE NOTE

Damage due to incorrect mains voltage

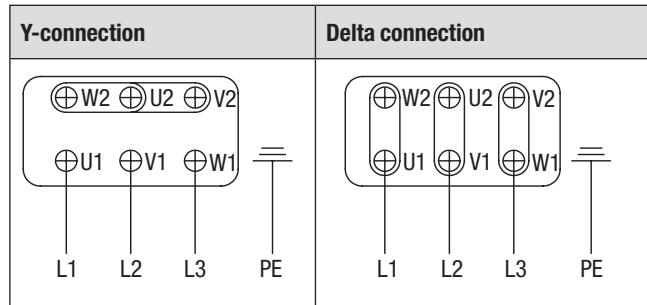
The dosing pump can be damaged if you connect it to the wrong mains voltage.

⇒ Observe the information on the mains supply that is given on the rating plate.

- The electrical connection of the dosing pump must be made according to local rules and regulations and may only be carried out by qualified technical personnel.
- Cable type and cross-section of the supply lines must be chosen according to the motor data.
- The cable passage to the motor terminal box must be made professionally. We recommend using gland connections with strain-relief clamp.
- The required protection degree must be ensured by installing the electrical connections professionally.
- To avoid dosing errors at the end of the process, the dosing pump must be locked electrically and hydraulically.

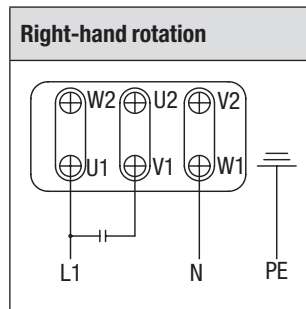
9.1 Circuit diagrams of the drive motor

Three-phase motors



Tab. 11: Three-phase motors circuit diagrams

Alternating current motor in a Steinmetz circuit




Tab. 12: Alternating current motor circuit diagrams

Special design: Please refer to the separate wiring diagrams for other electrical designs.

10 Control

Stroke length adjustment

The desired delivery rate of the dosing pump is set using the stroke length adjustment. Turning the adjustment knob adjusts the hub length and so increases or decreases the amount of dosing media from the dosing head.

 The stroke length should not be adjusted while the dosing pump is stopped!

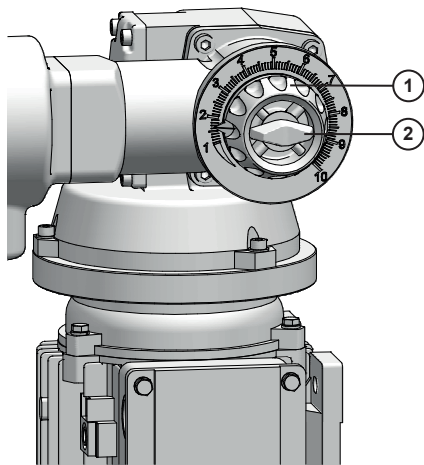


Fig. 7: Stroke length adjustment

Direction of rotation	Effect
Counter-clockwise	Stroke length is raised, delivery rate increases
Clockwise	Stroke length is reduced, delivery rate decreases

Tab. 13: Stroke length adjustment

The scale on the stroke length adjustment shows the value of the setting in percentage terms from 0% (stopped) to 100% (maximum possible stroke length).


Perform the following working steps:


1. Disconnect the fastening bolt of the adjusting knob (2) by turning it anti-clockwise (leftwards).
2. Set the stroke length to the desired value in accordance with the delivery characteristic curve (see section "15 Delivery characteristic curves" on page 27).
3. Re-tighten the fastening bolt whilst retaining the stroke length setting.

✓ **Stroke length adjusted.**

11 Operation

11.1 Start-up

	WARNING
<p>Caustic burns or other burns through dosing media!</p> <p>After connecting the mains supply, residual dosing media in the dosing head can spray out.</p> <ul style="list-style-type: none"> ⇒ Wear the recommended personal protective equipment. ⇒ Make sure that the materials you are using are suitable for the dosing medium. ⇒ Make sure that the lubricants, adhesives, sealants, etc. that you use are suitable for the dosing medium. ⇒ Install a leakage drain. ⇒ Install pressure relief valves. 	


	CAUTION
<p>Danger of automatic start up!</p> <p>The dosing pump does not have an ON/OFF switch and may start to pump as soon as it is connected to the mains supply. This means that dosing medium can escape. Depending on the type and hazardousness of the dosing medium, this can result in injury.</p> <ul style="list-style-type: none"> ⇒ Set the stroke length setting to 0% before disconnecting it from the power supply. ⇒ Ensure that the dosing pump has been installed correctly before connecting it to the mains supply. 	

Pre-conditions for actions:


- ✓ The dosing pump was installed completely.
- ✓ Use your personal protective equipment.

Perform the following working steps:


1. Switch on the dosing pump via an external control which needs to be installed.
2. Set the manual stroke length setting to maximum stroke to improve priming. During the initial priming, there should be no backpressure. For this purpose, we recommend installing a relief valve on the discharge side of the dosing pump.
3. If a priming aid has been installed, first fill this with chemical.
4. If the dosing pump does not prime, switch off the dosing pump, unscrew the pressure valve and fill the dosing head with fluid. With a non-dangerous medium, use the dosing medium itself or a neutral medium which does not interrupt the process (water is often suitable).

	WARNING
<p>Caustic burns or other burns through dosing media!</p> <p>Chemical may spray out. This may lead to chemical or other burns.</p> <ul style="list-style-type: none"> ⇒ Ensure that there is no positive pressure in the line before disconnecting the pressure connection. 	


5. Refit the pressure valve.
6. Switch the dosing pump back on and let it prime.
7. If a vent valve is integrated in the dosing head or is presented as a separate fitting, open it while the dosing pump is operating until fluid comes out. Then close it again.
8. With slightly outgassing media, set continuous flow out (approx. 1 drop per 1 – 3 strokes).
9. Once correct supply has been established, set the desired delivery rate on the adjusting knob (see section “10 Control” on page 19) or using the electrical remote adjustment. For an initial approximation, refer to the delivery characteristic curves (see chapter “15 Delivery characteristic curves” on page 27).

	Depending on the installation and the chemicals used, these values may differ and must be checked under operating conditions.
---	---

✓ **The dosing pump is commissioned.**

	The manufacturer of the dosing equipment is not responsible for damage resulting from excessive or insufficient dosing in the dosing pump or missing and faulty installation of peripheral fittings.
---	--

11.2 Shut-down

	WARNING
<p>Caustic burns or other burns through dosing media!</p> <p>Chemical may spray out. This may lead to chemical or other burns.</p> <ul style="list-style-type: none"> ⇒ Ensure that there is no positive pressure in the line before disconnecting the pressure connection. 	

Before starting any maintenance work or before long downtimes, drain the chemicals from the dosing pump and rinse it thoroughly with a neutral medium.

Pre-conditions for actions:

- ✓ Use your personal protective equipment (protective suit, protective gloves and protective goggles)

- ✓ Comply with the valid accident prevention regulations.

Perform the following working steps:

1. Stop the dosing pump in accordance with the selected operating mode.
2. Unplug the dosing pump's mains plug from the power supply.
3. Disconnect all electrical connections.
4. Depressurize all the hydraulic parts in the system.
5. Unplug all the hydraulic connections on the dosing pump.
6. Empty the dosing head.
7. Remove any residual dosing medium from the dosing head by flushing the system with a washing agent. Ensure that the washing agent is compatible with the dosing medium.
8. Dispose of the excess chemical correctly.

- ✓ **Dosing pump is decommissioned.**

11.3 Shutting down in an emergency

- In an emergency, you must immediately disconnect the dosing pump from the mains supply or activate the Emergency Stop switch installed in the system.
- Depending on the type of incident, you must depressurized the hydraulic connections or locked to prevent dosing medium from escaping.
- You must follow the safety data sheet of the dosing medium.

11.4 Storage

Storing the dosing pump correctly extends its service life. You should avoid negative influences such as extreme temperatures, high humidity, dust, chemicals, etc.

Ensure ideal storage conditions where possible:

- The storage place must be cold, dry, dust-free and moderately ventilated.
- Temperatures between + 2 °C and + 40 °C (for PP and PVDF dosing heads, between + 2 °C and + 60 °C)
- Relative air humidity must not exceed 90 %

11.5 Transportation

Perform the following working steps:

- The unit should be thoroughly cleaned. Any dangerous dosing media must be additionally neutralised and decontaminated.
- All accessories should be dismantled.
- All openings should be closed, so that no foreign objects can get into the system.
- The dosing pump must be suitably packed, preferably in the original packing, for transportation.


If the device is sent back to the manufacturer, please follow chapters 17 "Declaration of no objection" on page 29 and 18 "Warranty claim" on page 30.


11.6 Disposal of old equipment


- The waste unit must be thoroughly cleaned. Any dangerous dosing media must be additionally neutralised and decontaminated.
- Any residual dosing media must be removed in a professional manner.
- The dosing pump must be disposed of in accordance with applicable local laws and regulations. The device does not belong to household waste!
- As the disposal regulations may differ from country to country in the European Union, please consult your supplier if necessary.

12 Maintenance

Dosing pumps by Lutz-Jesco are manufactured to the highest quality standards and have a long service life. Nevertheless, some of their parts are subject to wear due to operation (e.g. diaphragms, valve seats, valve balls). This means that regular visual inspections are necessary to ensure a long operating life. Regular maintenance will protect the dosing pump from operation interruptions.

 DANGER
<p>Mortal danger from electric shock!</p> <p>Live parts can inflict fatal injuries.</p> <ul style="list-style-type: none"> ⇒ Before carrying out any maintenance work, always disconnect the dosing pump from the power supply. ⇒ Secure the dosing pump from accidental power-up. ⇒ The protective conductor (earth) may only be removed during the last step. ⇒ After maintenance work, all earthing measures must be restored.

 WARNING
<p>Caustic burns or other burns through dosing media!</p> <p>While working on the dosing head, valves and connections, you may come into contact with dosing media.</p> <ul style="list-style-type: none"> ⇒ Wear the recommended personal protective equipment. ⇒ Rinse the dosing pump with a medium (e.g. water) which does not pose any risk. ⇒ Release pressure in hydraulic parts. ⇒ Before connecting the mains supply, connect the dosing lines. ⇒ Check that all the screw connections have been tightened correctly and are leak-proof.

 CAUTION
<p>Danger of personal injury and material damage!</p> <p>The dosing pump can generate a pressure that is many times the rated one. The dosing medium can escape in the case of material failure or wear on the dosing head, the connection pipe or the seals that are used.</p> <ul style="list-style-type: none"> ⇒ Carry out maintenance work at the recommended intervals.

12.1 Maintenance intervals

This table gives you an overview of maintenance work and the intervals at which you must carry it out. The next few sections contain instructions for carrying out this work.

Maintenance work to be carried out	Frequency
Check that piping is seated firmly	Regularly
Check that suction and pressure valves are seated firmly	Regularly
Clean suction and pressure valves	Regularly
Check that electrical connections are not damaged	Regularly
Tighten up dosing head bolts	<ul style="list-style-type: none"> ■ Regularly ■ Before initial commissioning ■ After each diaphragm change
Check diaphragm for leakage due to rupture	Regularly (as long as no leak monitoring system is installed)
Check that the installed accessories are functioning correctly	Regularly
Check the dosing pump for unusual noises during operation, unusual temperatures or smells	Regularly
Replace parts that are subject to wear (diaphragms, valves, seals, etc.)	When unacceptable levels of wear are detected
Rinse out and clean the dosing pump	<ul style="list-style-type: none"> ■ Before changing diaphragms ■ Before taking out of service for a long period of time ■ After feeding aggressive, sticky, crystallising or contaminated liquids
Checking the electric servomotor	Regularly

Tab. 14: Maintenance information and maintenance intervals

12.2 Lubrication

PLEASE NOTE

Damage to the drive from oil spread on it.

The drive unit of this dosing pump is not designed for oil lubrication.

⇒ Only use the greases specified in this section for lubrication.

The MIDIDOS C diaphragm dosing pump is designed to be easy to maintain. The pump gearbox is lifetime lubricated with a molybdenum disulphide lubricant. Nevertheless, under harsh operating conditions such as high ambient temperatures and continuous operation, the grease should be replaced after every 5000 operating hours. The following lubricant can be used for this purpose: Molykote BR 2 plus or OKS400.

12.3 Diaphragm replacement

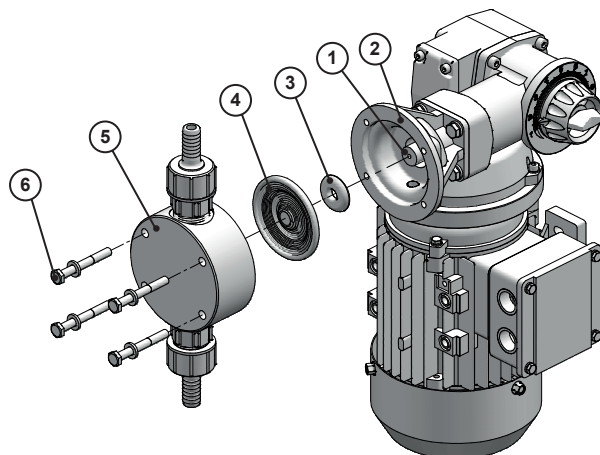


Fig. 8: Diaphragm replacement

12.3.1 Preparation

Precondition for action:

- ✓ You have depressurised the hydraulic sections of the plant.
- ✓ You have rinsed the dosing pump using a safe medium (e.g. water).

Perform the following working steps:

1. Remove the dosing head screw (6) with a suitable tool. Support the dosing head whilst doing so and if necessary, the pressure plate, so that these parts do not fall.
2. Remove the dosing head and any pressure plate.

12.3.2 Remove the old diaphragm

Perform the following working steps:

1. Switch the motor on. Should the drive not be connected to the network, the motor can be turned by hand on the fan wheel with a dismantled fan cowl.

2. Confirm the anticlockwise stroke length adjustment in the direction 0 %.
3. Holding the diaphragm (4) on its edge, pull it from the diaphragm flange and turn it out in an anti-clockwise fashion. If it is difficult to move, use pincers on the diaphragm edge. Threads which are difficult to move can be hit lightly on the face of the diaphragm centre in order to loosen the connection.

✓ **Diaphragm removed.**

12.3.3 Install a new diaphragm

PLEASE NOTE

Damage to the dosing head/diaphragm leaks

If you tighten the screws too much, this can lead to the dosing head being damaged. However, not tightening the screws enough leads to the diaphragm being leaky and correct functioning being affected.

⇒ Tighten the screws to the following torques:

- MIDIDOS C 24, 48 and 72: 2 Nm
- MIDIDOS C 120: 6 Nm

Precondition for action:

- ✓ Diaphragm rod (1), diaphragm flange (2) and any necessary support plate (3) were cleaned thoroughly and checked for damage and wear. Any remaining medium residue or surface damage could cause premature wear to the diaphragm.
- ✓ The diaphragm (4) thread was lightly greased (e.g. Molykote® Longterm W2).


Perform the following working steps:

1. Push the support plate (3) onto the membrane threaded supports with the curved side facing the threaded pin of the diaphragm.
2. Screw the diaphragm (4) together with the support plate clockwise until it is securely fitted in the membrane rod.
3. Before screwing on the dosing head, it is first necessary to approach a neutral position in the rear end position of the diaphragm.
4. To do this, turn the stroke adjustment in an anti-clockwise direction in the direction 100 %. The membrane enters the diaphragm flange.
5. Place the dosing head (5) and the pressure plate in front of the diaphragm flange. Watch for the weight of the dosing head during large pumping operations; especially with the stainless steel version. Where necessary, support the dosing head at the correct height.
6. Lead the fastening screws through (6) the drill holes in the dosing head and tighten them cross-wise e.g. top left – bottom right – top right – bottom left.

✓ **Diaphragm change finished.**

12.4 Clean suction and pressure valves

Contaminated valves affect the dosing precision and this means that you should clean the valves on a regular basis.

 Suction and pressure valves differ in the sequence of assembly of the individual parts. Disassemble them one at a time to prevent parts being mixed up.

Finally, screw the valves at first finger-tight into the dosing head. While doing this, ensure that the seals or O-rings are correctly seated inside the valves and the dosing head.



WARNING

Caustic burns or other burns through dosing media!

If valves are serviced without replacing the seals, it can lead to leakage and to an eventual escape of the dosing media.

⇒ Replace the seals when maintaining the valves.

Required torque for tightening plastic valves into the dosing head:

MIDIDOS C	Torque ($\pm 10\%$)
24, 48, 72	5 Nm
120	15 Nm

Tab. 15: Valve torque

For stainless steel valves with fibre seals or seals made of PTFE, the given torque values are the minimum values. Due to their elastic deformation, these must be re-tightened several times.

13 Troubleshooting

See below for information about how to rectify faults on the device or the system. If you cannot eliminate the fault, please consult with the manufacturer on further measures or return the dosing pump for repair.

Error	Possible cause	Remedy
Dosing pump delivers nothing or too little.	Valve leaking or blocked	→ Clean the valves and vent the dosing pump. See also "Start-up"
	Valve installed incorrectly	→ Reassemble the valves. Ensure that the valve balls are located above the valve seats.
	Suction valve or suction line leaking or blocked.	→ Clean or seal suction line.
	Suction head too high	→ Set the dosing pump at the inlet. → Install the pulsation dampener on the suction side. → Install a priming aid.
	Viscosity too high	→ Install spring-loaded valves. → Increase the pipe diameter. → Use a special dosing head. → Contact Lutz-Jesco.
No stroke movement observed	Dosing pump set to zero stroke.	→ Set the stroke length adjusting knob correctly.
	Diaphragm return spring broken.	→ Replace the spring.
	Power supply interrupted	→ Switch on power supply.
Frequent diaphragm failures	No support plate. See section "12 Maintenance" on page 22	→ Install new diaphragm and support plate. When replacing the diaphragm, check whether the diaphragm rod is corroded by sprayed medium.
	Diaphragm not screwed up to end stop on diaphragm rod.	→ Screw a new diaphragm up to the end stop. Support plate must be clamped between diaphragm and diaphragm rod.
	System backpressure too high (measured at discharge connection of dosing pump)	→ Inspect the system. Clean blocked injection nozzle. Install pulsation dampeners to reduce pressure peaks if pipes are too long. Check function of safety valves.
Delivery from dosing pump too high (siphoning.)	Pressure on suction side too high.	→ Install back-pressure valve or suction pressure regulator.
	Stroke stop shifted.	→ Readjust stop.
Dosing pump very noisy.	Roller bearing defective	→ Replace the roller bearing.
	Gear without dry lubricant	→ e. g. replace with Molykote®.
Motor hums and does not start.	Wrongly connected.	→ Check electrical wiring.
	Capacitor defective, wrong size or connected incorrectly.	→ Connect the capacitor correctly or replace.
	Pressure too high.	→ Check the process.

Tab. 16: Troubleshooting

14 Spare parts

Only use original spare parts supplied by the manufacturer. The wearing parts for MIDIDOS C are available as a spare parts set.



Dosing heads and spare parts are available in various materials and material combinations. Further information is available from the manufacturer.

Spare parts

- Diaphragms
- Support plate
- Dosing head, including mounting bolts
- Double-ball valves / spring-loaded valve complete

Spare parts set consisting of:

- Flat gaskets
- Valve balls
- (spring)
- Valve seats
- Diaphragms

15 Delivery characteristic curves

The delivery characteristic curves refer to water at 20°C (68°F). The delivery capacity depends on the medium (density and viscosity) and temperature. Dosing pumps must therefore be gauged in litres during application.

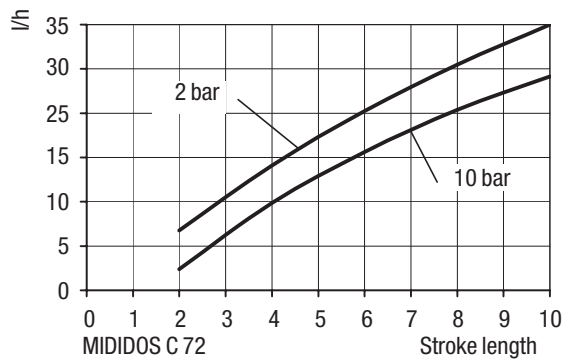
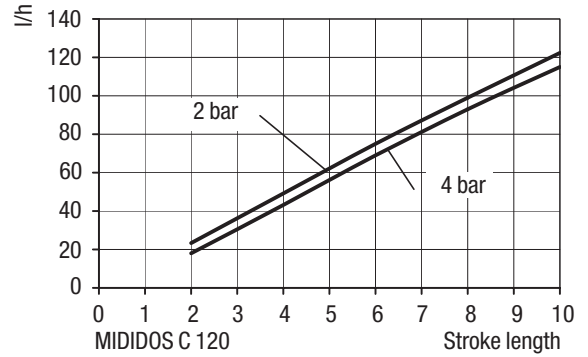
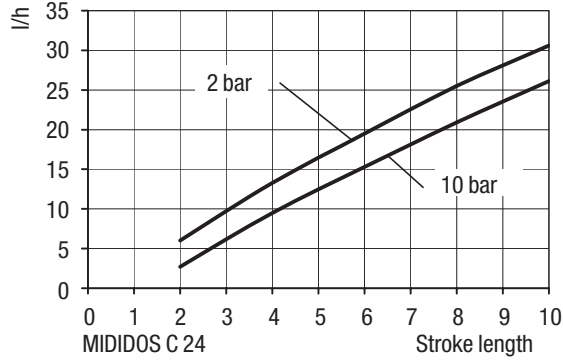
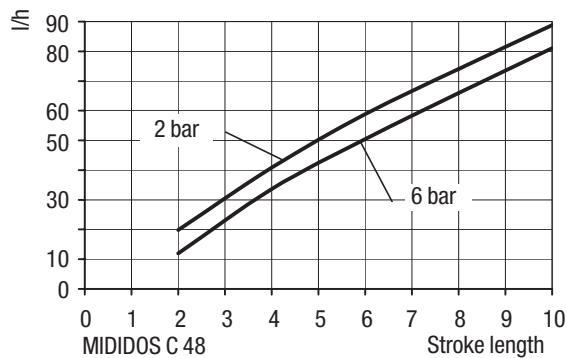


Fig. 9: Delivery characteristic curves MIDIDOS C



16 EU declaration of conformity MIDIDOS C



(DE) EU-Konformitätserklärung

Hiermit erklären wir, dass das nachfolgend bezeichnete Gerät aufgrund seiner Konzipierung und Bauart sowie in der von uns in Verkehr gebrachten Ausführung den einschlägigen grundlegenden Sicherheits- und Gesundheitsanforderungen der aufgeführten EG-Richtlinien entspricht. Bei einer nicht mit uns abgestimmten Änderung am Gerät verliert diese Erklärung ihre Gültigkeit.

(EN) EU Declaration of Conformity

We hereby certify that the device described in the following complies with the relevant fundamental safety and sanitary requirements and the listed EC regulations due to the concept and design of the version sold by us.
If the device is modified without our consent, this declaration loses its validity.

(FR) Déclaration de conformité UE

Nous déclarons sous notre propre responsabilité que le produit ci-dessous mentionné répond aux exigences essentielles de sécurité et de santé des directives CE énumérées aussi bien sur le plan de sa conception et de son type de construction que du modèle que nous avons mis en circulation.
Cette déclaration perdra sa validité en cas d'une modification effectuée sur le produit sans notre accord explicite.

(ES) Declaración de conformidad UE

Por la presente declaramos que, dados la concepción y los aspectos constructivos del modelo puesto por nosotros en circulación, el aparato mencionado a continuación cumple con los requisitos sanitarios y de seguridad vigentes de las directivas de la U.E. citadas a continuación.
Esta declaración será invalidada por cambios en el aparato realizados sin nuestro consentimiento.

(PT) Declaração de conformidade UE

Declaramos pelo presente documento que o equipamento a seguir descrito, devido à sua concepção e ao tipo de construção daí resultante, bem como a versão por nós lançada no mercado, cumpre as exigências básicas aplicáveis de segurança e de saúde das directivas CE indicadas.
A presente declaração perde a sua validade em caso de alteração ao equipamento não autorizada por nós.

Bezeichnung des Gerätes:	Motor-Membrandosierpumpe
Description of the unit:	Motor-driven diaphragm dosing pump
Désignation du matériel:	Pompe doseuse à membrane entraînée par moteur
Descripción de la mercancía:	Bomba dosificadora de membrana accionada por motor
Designação do aparelho:	Bomba doseadora de membrana a motor
Typ: Type:	MIDIDOS C
EG-Richtlinien: EC directives:	2006/42/EG, 2014/35/EU Die Schutzziele der Niederspannungsrichtlinie 2014/35/EU wurden gemäß Anhang I, Nr. 1.5.1 der Maschinenrichtlinie 2006/42/EG eingehalten. The protective aims of the Low Voltage Directive 2014/35/EU were adhered to in accordance with Annex I, No. 1.5.1 of the Machinery Directive 2006/42/EC.
Harmonisierte Normen: Harmonized standards:	DIN EN ISO 12100:2011-03, DIN EN 809:2012-10
Dokumentationsbevollmächtigter: Authorized person for documentation:	Lutz-Jesco GmbH

Heinz Lutz
Geschäftsführer / Chief Executive Officer
Lutz-Jesco GmbH
Wedemark, 10.05.2021

Lutz-Jesco GmbH
Am Bostelberge 19
30900 Wedemark
Germany

17 Declaration of no objection

Declaration of no objection

Please fill out a separate form for each appliance!

We forward the following device for repairs:

Device and device type: Part-no.:

Order No.: Date of delivery:

Reason for repair:

.....

.....

Dosing medium

Description: Irritating: Yes No

Properties: Corrosive: Yes No

We hereby certify, that the product has been cleaned thoroughly inside and outside before returning, that it is free from hazardous material (i.e. chemical, biological, toxic, flammable, and radioactive material) and that the lubricant has been drained.

If the manufacturer finds it necessary to carry out further cleaning work, we accept the charge will be made to us.

We assure that the aforementioned information is correct and complete and that the unit is dispatched according to the legal requirements.

Company / address: Phone:

..... Fax:

..... Email:

Customer No.: Contact person:

Date, Signature:

18 Warranty claim

Warranty claim

Please copy and send it back with the unit!

If the device breaks down within the period of warranty, please return it in a cleaned condition with the complete warranty claim.

Sender

Company: Phone: Date:

Address:

Contact person:

Manufacturer order no.: Date of delivery:.....

Device type: Serial number:

Nominal capacity / nominal pressure:

Description of fault:.....

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

Service conditions of the device

Point of use / system designation:.....

.....
.....

Accessories used (suction line etc.):.....

.....
.....
.....
.....

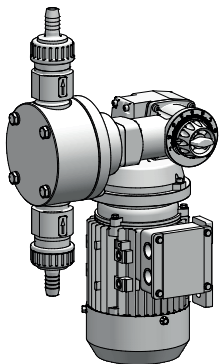
Commissioning (date):

Duty period (approx. operating hours):

Please describe the specific installation and enclose a simple drawing or picture of the chemical feed system, showing materials of construction, diameters, lengths and heights of suction and discharge lines.

19 Index

A		R	
Accessories	16	Rating plate	10
Approved media temperature	12	S	
B		Safety	5
Back-pressure valve	17	Scope of delivery	10
C		Shutting down in an emergency	21
Clean suction and pressure valves	23	Signal words	
D		Explanation	4
Declaration of no objection	29	Spare parts	26
Delivery characteristic curves	27	Specialist staff	6
Design of the system	15	Storage	21
Diaphragms		Structure of the dosing pump	10
Replace	23	Suction pressure regulator	17
Dimensioned drawings	13	Suspensions	17
Dimensions	13	System piping	15
Disposal of old equipment	21	T	
Dosing media		Technical data	11
Approved media temperature	12	Temperatures	
Prohibited dosing media	8	Approved ambient temperature	11
F		Approved media temperature	12
Foreseeable misuse	8	Transportation	21
Function description	10	Troubleshooting	25
G		W	
General warnings	5	Warnings	
H		General warnings	5
Handling instructions		Marking	4
Marking	4	Warning sign	
Hazards due to non-compliance with the safety instructions	5	Explanation	4
Hydraulic accessories	16	Warranty claim	30
I		Working in a safety-conscious manner	6
Injection nozzle	16	L	
Intended purpose	8	Level monitoring	17
Intended use	8	M	
L		Maintenance	22
Level monitoring	17	Maintenance intervals	22
M		N	
Maintenance	22	Notes for the Reader	4
Maintenance intervals	22	P	
N		Personnel qualification	6
Notes for the Reader	4	Pressure relief valve	16
P		Priming aid	17
Personnel qualification	6	Product description	10
Pressure relief valve	16	Product warranty	8
Priming aid	17	Prohibited dosing media	8
Product description	10	Pulsation dampener	17
Product warranty	8		
Prohibited dosing media	8		
Pulsation dampener	17		



Lutz-Jesco GmbH

Am Bostelberge 19
D-30900 Wedemark

Phone: +49 5130 5802-0
info@lutz-jesco.com
www.lutz-jesco.com

Operating instructions
MIDIDOS C