
Translation of the original instructions

PISTON DOSING PUMP

FEDOS LP

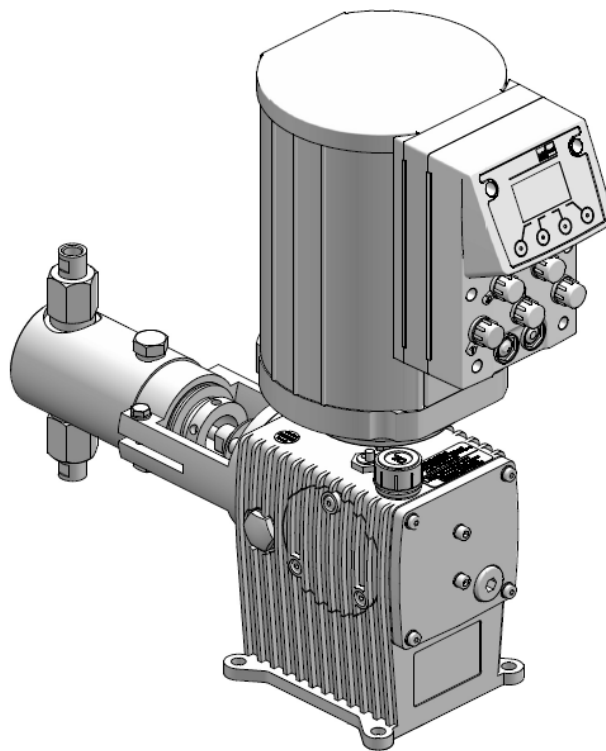


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1 About these operating instructions

This document:

- Is part of the product.
- Describes the safe and correct use of the product in all operating phases.
- Must be read completely before the product is commissioned.
- Must be read and applied by every person tasked with working on the product.
- Must be kept for the duration of the service life of the product.
- Must be passed on to any subsequent owner of the product.

1.1 Target groups

Target group	Task
Operator	1. Keep these operating instructions available at the place of use of the product, including for later use. 2. Instruct employees to read and comply with these instructions, especially the safety instructions and warnings. 3. Comply with additional system-related specifications and regulations.
Qualified personnel Trained persons	► Read, observe and follow these operating instructions, in particular the safety instructions and warnings.

Table 1: Target groups and their tasks

1.2 General non-discrimination

For better readability, these operating instructions always use the masculine form when referring to persons. However, all genders are addressed equally.

1.3 Warnings

Warnings are intended to help you recognise risks and avoid negative consequences. They are structured as follows in these operating instructions:

Warning sign **SIGNAL WORD**

Type and source of danger

Consequences of non-compliance

- A safety precaution to be taken to eliminate the hazard.

Fig. 1: Design of warnings

Signal words

These operating instructions use the following signal words to emphasise the severity of possible injuries if the danger is ignored:



DANGER

Imminent danger

Non-compliance can result in death or serious injury.



WARNING

Possible danger

Non-compliance can lead to death or severe injuries.



CAUTION

Potentially hazardous situation

Non-compliance can result in minor injuries.



NOTE

Potentially hazardous situation

Non-compliance can result in damage to property or malfunctions.



INFORMATION

Information or recommendation

Simplifies handling or extends the service life of the product or system.

Warning signs used

These operating instructions use the following warning signs to indicate the type and source of danger:



General hazard



Danger from electrical voltage



Danger from corrosive substances



Danger from automatic startup



Risk of machine damage or malfunction



Danger of crushing

1.4 Action steps

Action steps are structured as follows:

- ✓ This prerequisite must be met before you can start with the action steps.

► Single step

Multiple steps in sequence are structured as follows:

1. First step

2. Second step

↳ Intermediate result of a step

▢ Overall result

1.5 Cross-references

Cross-references are marked with an arrow.

Example: (→ Fig. 5)

1.6 Latest version

Please find the latest version of these operating instructions at www.lutz-jesco.com.

1.7 Copyright

The content of these operating instructions and the images contained in them are subject to the copyright protection of Lutz-Jesco GmbH.

2 Safety

2.1 General warnings

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

Safety instructions that warn against risks arising from specific activities or situations can be found in the respective sub-sections.



DANGER

Mortal danger from electric shock!

Wrongly connected or located cables or damaged ones can injure you.

- ▶ Connect the device only to a SCHUKO socket outlet protected by a ground fault circuit interrupter (GFCI).
- ▶ Replace damaged cables without delay.
- ▶ Do not use extension cables.
- ▶ Do not bury cables.
- ▶ Secure cables to avoid damage caused by other equipment.



DANGER

Danger to life through explosions!

When using dosing devices without ATEX certification in a potentially explosive area, explosions can occur that result in fatal injuries.

- ▶ Never use the device in potentially explosive areas.



DANGER

Danger of crushing!

When the system is operated, minor to serious injuries to limbs may occur due to crushing between machine parts or tools.

- ▶ Do not reach into the system opening (even with tools).
- ▶ Always disconnect the voltage supply before carrying out any maintenance work.



WARNING

Danger from unsuitable materials

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.

- ▶ 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

Danger of automatic start up!

After the mains supply has been connected, residual dosing media in the dosing head can spray out.

- ▶ Before connecting the mains supply, connect the dosing lines.
- ▶ Check that all the screw connections have been tightened correctly and are leak-proof.



WARNING

Caustic burns or other burns through dosing media!

While working on the dosing head, valves and connections, you may come into contact with dosing media.

- ▶ 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

Danger when changing the dosing medium!

Changing the dosing media can provoke unexpected reactions, damage to property and injury.

- ▶ Clean the dosing pump and the system parts in contact with the media thoroughly before changing the dosing medium.



CAUTION

Increased risk of accidents due to insufficient qualification of personnel!

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.

- ▶ Ensure that all action is taken only by personnel with sufficient and corresponding qualifications.
- ▶ Prevent access to the system for unauthorised persons.



NOTE

Do not dispose of the device in the domestic waste!

Do not dispose of electric devices via the domestic waste.

- ▶ The device and its packaging must be disposed of in accordance with locally-valid laws and regulations.
- ▶ Dispose of different materials separately and ensure that they are recycled.

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 equipment.

The specific consequences can be:

- Failure of important functions of the product and the associated system
- Failure of required maintenance and repair methods
- Danger to persons
- Danger to the environment caused by leaking substances

2.3 Working in a safety-conscious manner

In addition to the safety instructions specified in these operating instructions, you must comply with additional safety regulations:

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

2.4 Personal protective equipment

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

The following protective equipment is recommended as a minimum:



Protective goggles



Protective clothing



Protective gloves

Table 2: Protective equipment required

Wear the protective equipment when performing the following tasks:

- Commissioning
- Working on the dosing pump during operation

- Shut-down
- Maintenance work
- Disposal

2.5 Personnel qualification

Any personnel who work on the product must have special knowledge and skills.

Anybody who works with the product 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 into the handling of the device
- Knowledge of safety equipment and the way this equipment functions
- Knowledge of these operating instructions, particularly the safety instructions and sections relevant for the activity
- Knowledge of fundamental regulations regarding health and safety and accident prevention

All persons must have one of the following minimum qualifications:

- Trained as a specialist to work independently with the product
- Sufficient training to work on the product under the supervision and guidance of a qualified specialist

These operating instructions differentiate between the following user groups:

Qualified personnel

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

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.

Trained persons have attended all trainings offered by the operator.

2.5.1 Personnel tasks

Incorrect handling of the product can cause severe personal injury and damage to property. Therefore, ensure that all work is carried out by qualified personnel only.

The following table shows which qualifications are required for the corresponding activities.

Qualification	Activities
Qualified personnel	• Assembly • Hydraulic installation • Electrical installation • Commissioning • Shut-down • Troubleshooting • Maintenance • Repairs • Disposal
Trained persons	• Storage • Transportation • Operation • Troubleshooting

Table 3: Personnel tasks

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 product is operated in a manner that is not consistent with these operating instructions, particularly the safety information, action steps and the intended use.
- Information on usage and environment is not adhered to.
- People operate the product who are not adequately qualified to carry out their respective activities.
- No original spare parts or accessories of Lutz-Jesco GmbH are used.
- Unauthorised changes are made to the product by the user.
- 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.
- Maintenance and inspection intervals are not adhered to as required or not adhered to at all.

3.2 Intended purpose

The device is intended for the following purpose only: the conveying and dosing of liquids.

3.3 Principles

- Comply with the information pertaining to the operation and ambient conditions.
- 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. Please note, the stability of the components can change as a result of operating pressure and media temperature.



INFORMATION

Information on the suitability of materials combined with different dosing media can be found in the Compatibility Chart of Lutz-Jesco GmbH.

The information in this resistance list is based on information from the material manufacturers and on expertise obtained by Lutz-Jesco 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 under operating conditions with the chemicals that you use.

- 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 a corresponding rating plate or an appropriate EC Declaration of Conformity for potentially explosive atmospheres.

3.4 Prohibited dosing media

The device must not be used for the following media and substances:

- Gaseous media
- Radioactive media
- Solid substances
- Combustible media
- All other media that are not suitable for delivery using this device

3.5 Foreseeable misuse

The following section specifies which applications of the device and its associated system constitute non-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 phases of the product's life cycle:

Incorrect assembly

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

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

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

Incorrect commissioning

- 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
- Recommissioning after maintenance work without restoring all of the protective equipment and fixtures etc.
- Inadequate protective clothing or none at all

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

Incorrect maintenance

- Carrying out maintenance during ongoing operation
- Carrying out work that is not described in the operating instructions
- 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 instructions
- 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
- Lines not fully reconnected
- Seals damaged or not fully installed
- No renewal of seals
- Non-compliance with safety data sheets
- Inadequate protective clothing or none at all

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

Incorrect disposal

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

4 Product description

4.1 Properties

The FEDOS LP is a piston dosing pump designed for use when precise dosing results are required.

It is characterized by the following properties:

- Capacity range of 0.5 to 30 l/h at a back pressure of up to 100 bar
- Operating modes: Manual mode, analogue input, pulse input, batch mode and network mode (FEDOS LP-Net only)
- Menu languages: English, German, French, Spanish, Portuguese, Dutch, Polish
- Real-time clock and date
- Release code and safety code
- Connections: M12x1 connector, A-, B- or D-coded

- Ethernet, network connection (FEDOS LP-Net only)

4.2 Scope of delivery

Carefully check the delivery prior to installation and refer to the delivery note to ensure that the delivery is complete and to check for any transport damage. Contact the supplier and/or carrier regarding any questions concerning the delivery and/or transport damage. Do not operate defective products.

The scope of delivery includes:

- Dosing pump FEDOS LP
- Operating instructions
- Inspection report and test certificate (optional)
- Accessory kit (optional)

4.3 Structure of the dosing pump

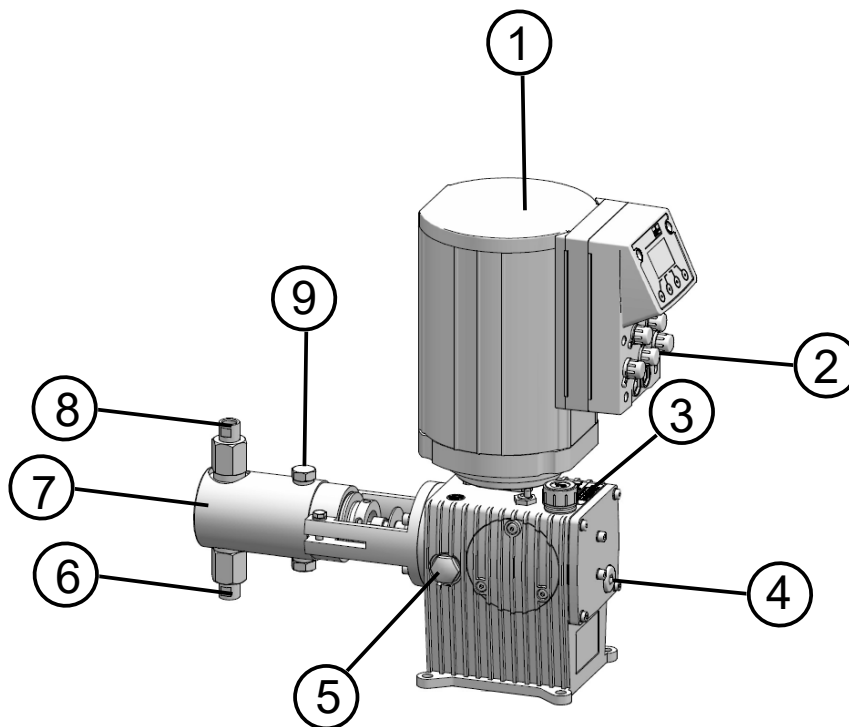


Fig. 2: Structure of the FEDOS LP dosing pump

1 Drive motor	2 Control unit
3 Oil inlet and gear venting	4 Oil drain
5 Oil inspection glass	6 Valve and connection on the suction side
7 Dosing head	8 Valve and connection on the discharge side
9 Flushing connector	

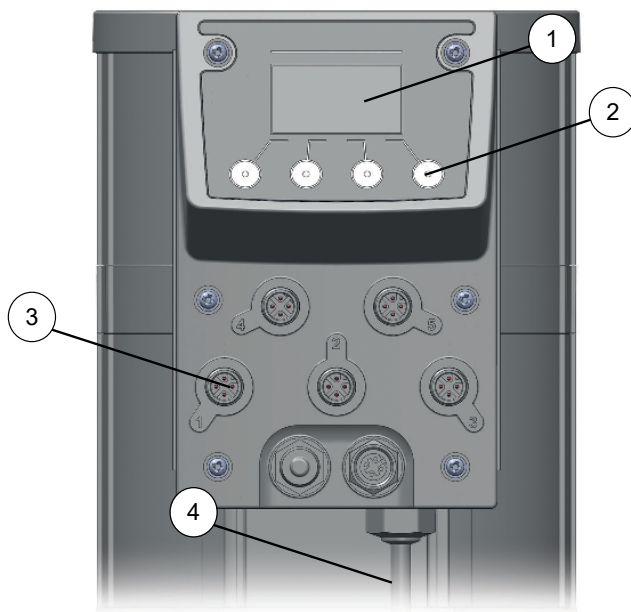


Fig. 3: FEDOS LP control unit

1 Graphic display	2 Multifunction keys on the control unit for operator inputs
3 Connection ports for external operation	4 Mains cable for power supply

3 Maximum delivery rate at 50 and 60 Hz	4 Maximum backpressure
5 Protection class	6 Power supply
7 WEEE label	8 Serial number
9 Part number	10 Month/year of manufacture
11 Label showing conformity with applicable European directives	12 Label showing conformity with applicable UK directives

4.4 Function description

The FEDOS LP is used when a frequency converter is required for dosing and the delivery rate needs to be displayed. To adjust the dosing capacity, the motor speed can be controlled via the display as well as with an analogue signal or a pulse signal.

4.5 Rating plate

The rating plate clearly identifies the product and provides important information such as the manufacturer, product designation, year of manufacture and technical and safety-relevant data. The rating plate must be kept legible for the duration of the service life of the product.

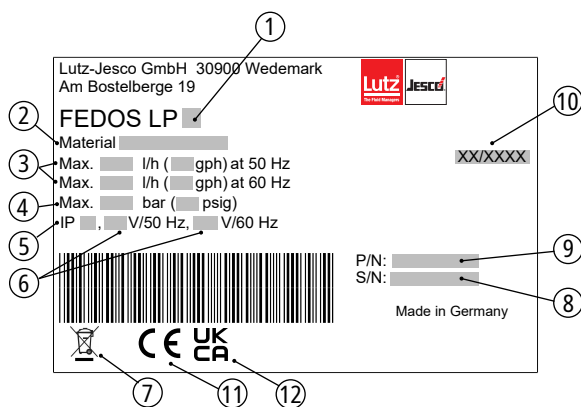


Fig. 4: FEDOS LP rating plate

1 Product type, nominal size	2 Material of the dosing head/seals
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5 Technical data

5.1 Delivery capacity 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.

Information		FEDOS LP size						
		05	1	2	5	8	16	30
Delivery capacity 50 Hz/60 Hz	l/h	0.55	1.52	2.1	4.6	7.7	15.5	28.5
Gear ratio		55	20	20	20	12	12	12
Max. stroke frequency	rpm	26	72	72	72	120	120	120
Stroke length	mm	7.5	7.5	10	10	10	10	10
Piston diameter	mm	8			12		17	23
Stroke volume	ml/stroke	0.352		0.486	1.07		2.15	3.96
Max. pressure	bar	40						25
Max. pressure**		100				80	40	25

Table 4: Delivery capacity FEDOS LP

** High-pressure version

5.2 Operating conditions and limits

Information		FEDOS LP (all sizes)
Approved ambient temperature	°C	5 – 45*
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	%	0/0.5 – 100 (adjustable in 0.1% increments)

Table 5: 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.

** Spring-loaded valves must be used if the viscosity exceeds ~300 mPa·s.

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

5.3 Approved media temperatures

Information		FEDOS LP (all sizes)
Dosing head made of stainless steel (1.4571)	°C	0 – 80

Table 6: Approved media temperatures

5.4 Other data

Information		FEDOS LP size						
		05	1	2	5	8	16	30
Weight	kg	15.5						
Protection class		IP55						
Valve nominal values		DN6						

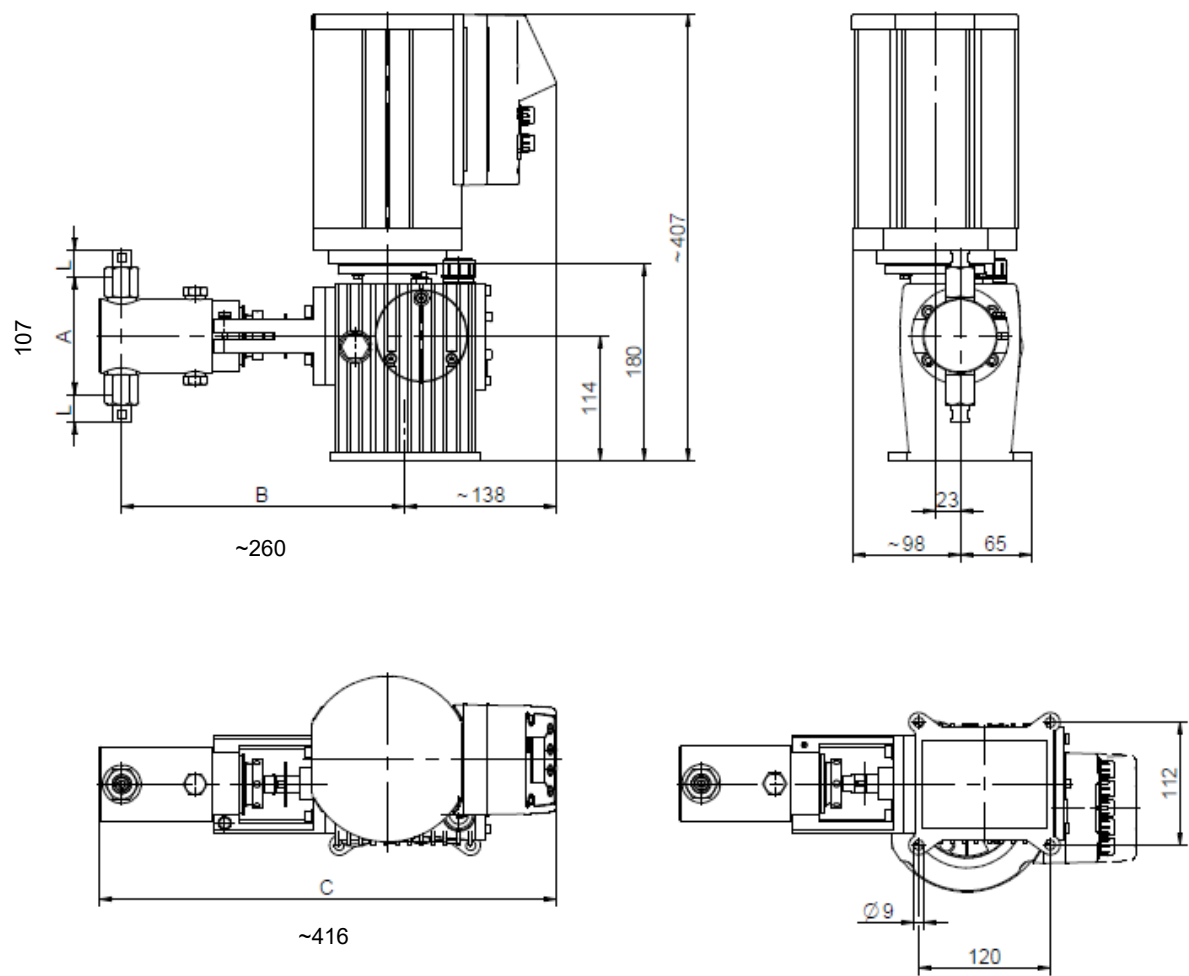
Table 7: Other data FEDOS LP

5.5 Motor data

Information	Unit	FEDOS LP All sizes
Power output	kW	0.25
Speed	min ⁻¹	1500
Nominal current	A	1.2
Voltage	V 1~	230
Mains voltage		DIN EC 60038
Frequency	Hz	50/60
Operating mode		S1
Protection class		IP55
Insulation class		F
Motor efficiency		Larger than 90% (energy efficiency class IE4)
Size		63
Flange diameter	mm	90
Shaft	mm	Ø11 x 23
Cooling		IC 411
Electrical cable	m	1.8 m (with mains plug)

6 Dimensions

All dimensions in millimetres (mm).



L depends on the connection type and size

Fig. 5: Dimension drawing FEDOS LP

7 Transportation



NOTE

Machine damage caused by leaking oil

The oil inlet at the dosing pump cannot be closed completely tightly. Oil may leak if the device is not transported in an upright position. This might cause damage to the control unit or the motor.

- Drain the oil completely through the oil outlet before you transport the dosing pump.

Please observe the following conditions when transporting the device:

- Clean the device thoroughly before transporting it. In the case of hazardous dosing media, you must also neutralise and decontaminate it.
- Dismantle all accessories.
- Close all openings so that no foreign objects can get into the device.
- Ensure that you send the device in suitable packaging, preferably in the original packaging.
- If the device is to be returned to the supplier/manufacturer, please note the documents to be enclosed.

8 Storage

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

Storage conditions

- The storage place must be cold, dry, dust-free and moderately ventilated.
- Temperatures should be between +2 °C and +40 °C.
- The relative humidity must be below 90%.

9 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 IP55.
- ▶ 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. Especially the oil level glass, the oil inlet and the oil drain.

Installation instructions

When installing, follow the basic principles below:

- The valves must be vertical: Pressure valve at top, suction valve at bottom. Observe the arrows on the valves. The dosing head and the valves must be positioned so that the arrows point vertically upwards.
- You should install the dosing pump at a convenient height for operation.
- The dosing pump must not be fitted to a wall without a wall bracket.
- The dosing pump must not be installed under the ceiling.
- The frame of foundation for fixing the dosing pump must not be subjected to jolts. The pump must be vibration-free and stable.
- There must be enough free space in the area of the dosing head and the suction and pressure valves for these parts to be easily dismantled if required. The entire space requirement for installation and maintenance is approximately 1 m².
- The distance from the sides of the dosing pump to the wall or other dosing pumps or equipment must be at least 3 cm. Ensure a sufficient air flow for cooling purposes.
- The maximum ambient temperature must be complied with. If necessary, radiant heat from surrounding equipment must be screened.
- Avoid exposure to direct sunlight.
- The dosing pump is not intended for outdoor use unless appropriate protective measures have been taken to prevent dust and water from entering the housing.
- Note the dimensions of the mounting holes.
- Install the dosing pump with the feet on a level surface.
- The tightening torque for the fastening bolts is 15 Nm.

9.1 Installation on a wall console

To reduce the structure-borne noise, the dosing pump is bolted to the wall bracket using rubber elements. The materials necessary for this are included with the wall bracket.

9.2 Hydraulic installation

This section describes the hydraulic parts of a system that you should install or can install additionally. In many cases, you must install hydraulic accessories to be able to use all the functions that the dosing pump offers, to guarantee functional safety or to achieve a high level of dosing precision.



WARNING

Caustic burns or other burns through dosing media!

A diaphragm rupture, blocked pressure lines or material unsuitable for the dosing medium can result in the discharge of the dosing medium. Depending on the type and hazardousness of the dosing medium, this can result in injury.

- ▶ 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!

High peak pressures can lead to piping vibrating and cause them to snap. This can result in injury from piping or escaping dosing media.

- ▶ Install pulsation dampeners.



NOTE

Damage to drives due to overloading

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.

- ▶ Ensure that the pressure on the discharge side is at least 1 bar than on the suction side.

**NOTE****Locking of threads**

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

- Grease the corresponding parts with a lubricant (e.g. PTFE spray) before screwing them together. Ensure that the lubricant is compatible with the dosing medium.

9.2.1 Design of the system

Please note the following points when designing your system:

- Take into account the technical data of the dosing pump (→ Technical data) and design your system accordingly (e.g. when planning the pipeline, consider pressure loss with respect to nominal width and length).
- Design the entire system and its integrated dosing pump in such a way that an escaping dosing medium (due to the failure of wearing parts such as the packing, or burst hoses) does not lead to permanent damage to system parts or the premises.
- 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 at the end of the process, the dosing pump must be locked electrically and 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.

**NOTE**

For constructional reasons piston pumps are not leakage-free. This must be taken into account in the design of the process and the plant.

9.2.2 System piping

Please note the following points when setting up your system's 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 via 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.

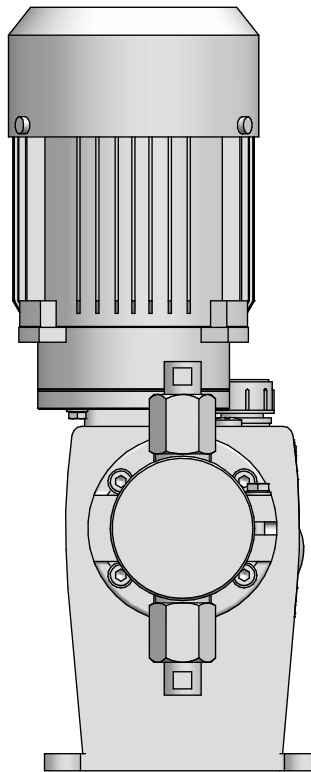
9.2.3 Suction and pressure valves

Fig. 6: 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

9.2.4 Flushing water connection

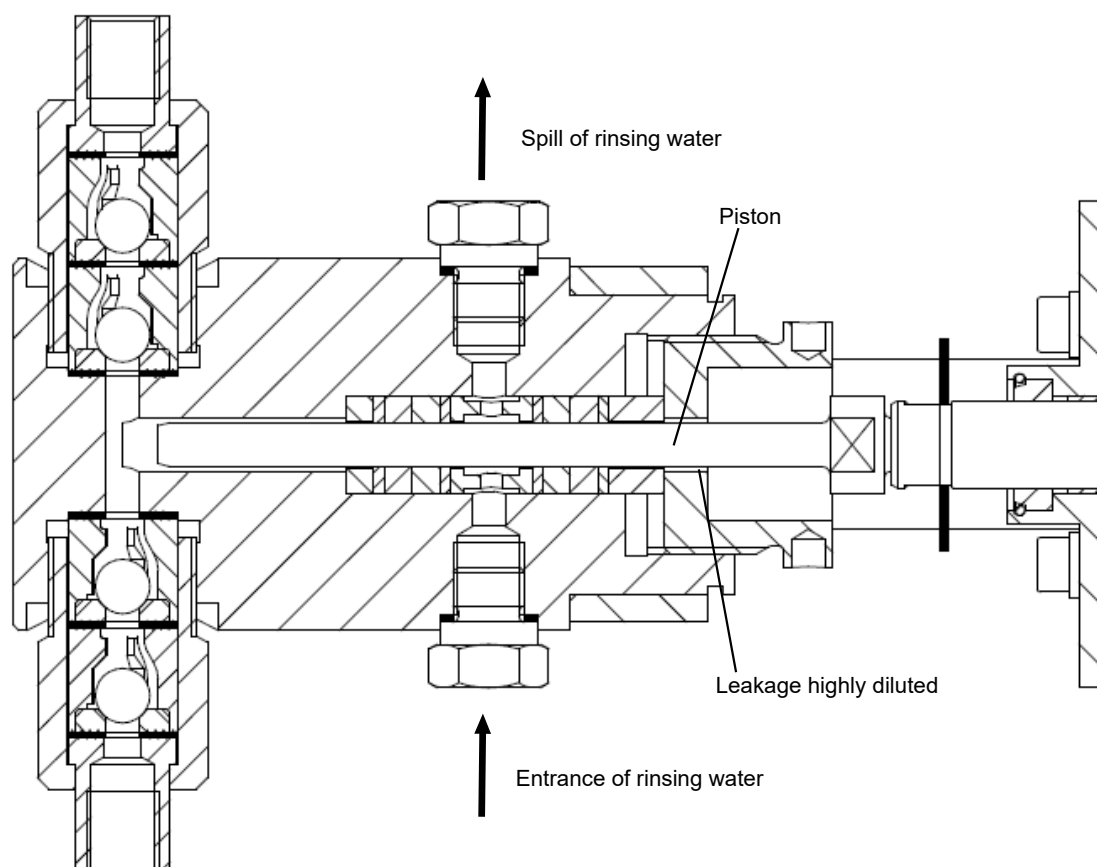


Fig. 7: Flushing water connection

The leakage means that piston pumps must not be used in conjunction with toxic and highly aggressive media. However, flushing the packing skirt thoroughly with water will reduce the concentration of the leaked toxic media to an insignificant concentration. This means that piston pumps can then be used to pump the aforementioned media. However, the use of the flushing depends to a large degree on the local conditions and the nature of the medium. When using abrasive media, it may be advisable to build up a pressure at the piston flushing skirt that is higher than the operating pressure, in order to flush any particles that may enter towards the medium.

9.2.5 Hydraulic accessories

The following subchapter is intended to provide an overview of the installation options.

Please note that these operating instructions are no substitute for the documentation supplied with the accessories. Comply with the safety instructions and all further instructions provided by the product documentation.

9.2.5.1 Injection nozzle

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

Injection nozzles have the following 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 crystallise, it is advisable to carry out installation into the main line from the bottom. This prevents air bubbles from being trapped.
- Some dosing media tend to soil the injection nozzle. This can result in blockages. In cases like this, it is advisable to install an injection nozzle that is easy to dismantle and block off.

When installing the injection nozzle, comply with the instructions provided in the operating instructions.

9.2.5.2 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.

9.2.5.3 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 depressurised pipelines.

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 back-pressure.

9.2.5.4 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

Pulsation dampers also perform important safety functions by preventing pressure peaks which cause the piping to vibrate and tear.

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.

9.2.5.5 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.

9.2.5.6 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.

9.2.5.7 Suction pressure regulator

A suction pressure regulator may be necessary if the suction-side installation of the system produces 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.
- Emptying the dosing tank in case of 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.

The installation of a suction pressure regulator prevents these problems. 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.

9.3 Electrical installation



DANGER

Mortal danger from electric shock!

It must be possible to disconnect the dosing pump from the power supply immediately, in order to prevent dangers following an accident or a technical defect.

- 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.

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



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.



NOTE

Insufficient electromagnetic compatibility

When you connect the dosing pump to a socket without an attached protective earth, it is not possible to guarantee the interference radiation and interference immunity according to EMC regulations.

- Only connect the dosing pump to sockets with an attached protective earth.

9.3.1 Principles

Observe the following principles during the electrical installation:

- The electrical connection comply with local regulations.
- The dosing pump must be plugged into a grounded power outlet.
- To avoid dosing errors at the end of the process, the dosing pump must be locked electrically.
- The dosing pump must not be operated by switching the mains voltage on or off.
- Signal cables must not be laid parallel to high-voltage current lines or mains cables. You must route supply and signal lines in separate channels. An angle of 90° is required at line crossings.

9.3.2 Description of connection sockets

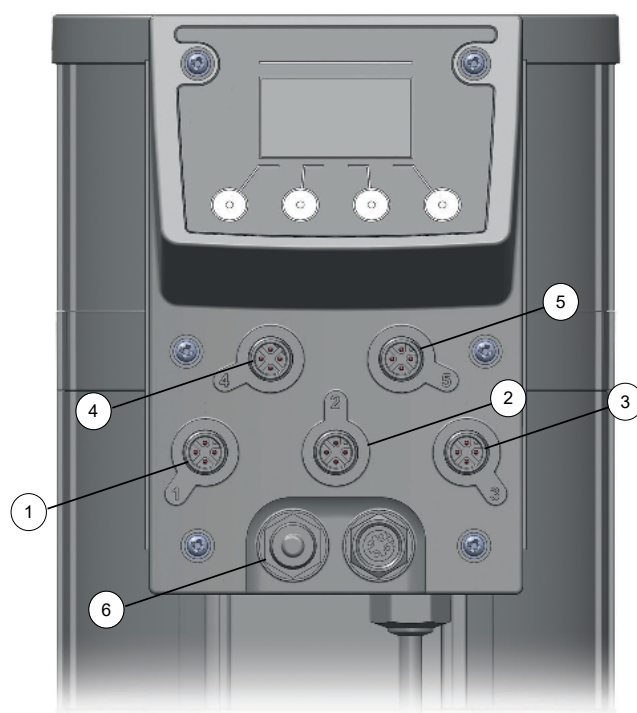


Fig. 8: FEDOS LP connections

1 Connection socket 1	2 Connection socket 2
3 Connection socket 3	4 Connection socket 4
5 Connection socket 5	6 Current output

Inputs	Connection socket
Release input	1
Pulse input	2
Analogue input	2
Level input	3
Dosing control input	5

Table 8: Inputs of the control unit

Outputs	Connection socket
Stroke feedback output, alternative:	1
Fault optocoupler output	
Fault reporting relay output	4

Table 9: Outputs of the control unit

9.3.2.1 Connection socket 1

Connection socket 1 is equipped with an optocoupler output and a release input. The optocoupler can be configured for stroke feedback or a fault message. The connections and switch data are listed in the following tables.

Pin	Function
Optocoupler (pin 1 and 2)	Max. 30 V DC, max. 5 mA
Release input (pin 3 and 4)	Potential-free circuit,

Pin	Function
	Open NC or closed NO
	Freely programmable

Table 10: Technical data connection port 1

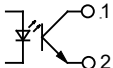
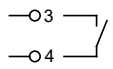
Pin	M12x1 (A-coded)	Assignments	Connection	Cable colour*	
1		Opto-coupler collector (+)		Brown	BN
2		Opto-coupler emitter (-)		White	WH
3		Ground (GND)		Blue	BU
4		External On/Off		Black	BK

Table 11: Connection socket 1

* Applies to cable colours of Lutz-Jesco GmbH cables. No liability is accepted for cables from other manufacturers.

Stroke feedback output

At the stroke feedback output, the dosing pump reports back each executed stroke to the pulse input of another dosing pump or PLC. In this way, it is possible to network several dosing pumps and to trigger synchronized dosing strokes.

The stroke feedback output can continue to be used e.g. to evaluate the signal in a PLC (stroke counting for batch mode).

The stroke feedback output in dynamic pulse mode and water meter mode is only for evaluation purposes and not for forwarding the signal.

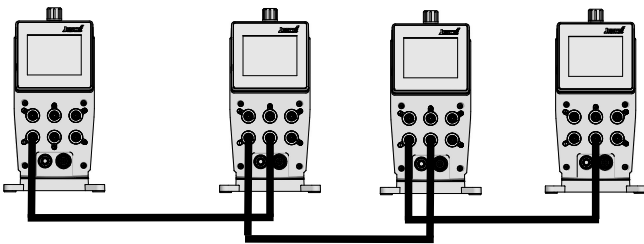


Fig. 9: Synchronisation of several dosing pumps by means of stroke feedback and pulse control

Fault reporting optocoupler

The optocoupler will notify dosing pump faults upon activation of this function. The message can be evaluated e.g. with a PLC.

Release input

Using the release input, it is possible to start or stop the dosing pump externally.

9.3.2.2 Connection socket 2

Analogue input

The analogue input makes it possible to control the delivery capacity by means of a 0/4 – 20 mA signal. The delivery capacity is regulated via the stroke frequency.

- 0/4 – 20 mA-Signal
- settable
- Current range variable
- Working resistance: 200 Ohm (because of electronic fuse)
- Potential-free

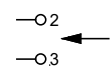
Pin	M12x1 (A-coded)	Assignments	Connection	Cable colour*	
1				Brown	BN
2		(+)0/4 – 20 mA		White	WH
3		Ground (GND)		Blue	BU
4	–	+5 V DC	–	Black	BK

Table 12: Connection socket 2

* Applies to cable colours of Lutz-Jesco GmbH cables. No liability is accepted for cables from other manufacturers.

Pulse input

The pulse input enables the control of the delivery rate by pulses. The system regulates the delivery capacity by means of the dosing pump's stroke frequency and number of strokes in dependence on the number of pulses and the pulse spacing.

- On-site, potential-free switching
- For potential-free closing contact, e.g. a contact water meter
- 5 V DC supply voltage (current across all connections limited to a total maximum of 50 mA)
- Pulse length min. 6 ms

Pin	M12x1 (A-coded)	Assignments	Connection	Cable colour*	
1		Pulses		Brown	BN
2		(+)0/4 – 20 mA		White	WH
3		Ground (GND)		Blue	BU
4	–	+5 V DC	–	Black	BK

Table 13: Connection socket 2

* Applies to cable colours of Lutz-Jesco GmbH cables. No liability is accepted for cables from other manufacturers.

9.3.2.3 Connection socket 3

Level input

Connection for level control of a dosing container (e.g. a suction line with a level switch).

- 5 V DC supply voltage (current across all connections limited to a total maximum of 50 mA)
- Alert and main alarm
- Potential-free circuit
- Programmable NC or NO contact

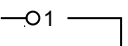
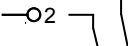
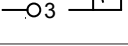
Pin	M12x1 (A-coded)	Assign- ments	Connection	Cable colour*	
1		Pre-alarm		Brown	BN
2		Main alarm		White	WH
3		Ground (GND)		Blue	BU
4	–	+5 V DC	–	Black	BK

Table 14: Connection socket 3

* Applies to cable colours of Lutz-Jesco GmbH cables. No liability is accepted for cables from other manufacturers.

9.3.2.4 Connection socket 4

Alarm relay output

Using the alarm relay, it is possible to forward outwards disturbances on the dosing pump.

- Potential-free changeover contact
- Max. 250 V AC, 2.5 A bzw. max. 30 V DC, 2.5 A

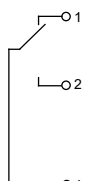
Pin	M12x1 (B-coded)	Assign- ments	Connection	Cable colour*	
1		Break contact (N.C.)		Brown	BN
2		Make contact (N.O.)		White	WH
3		–		Blue	BU
4		Changeover contact		Black	BK

Table 15: Connection socket 4

* Applies to cable colours of Lutz-Jesco GmbH cables. No liability is accepted for cables from other manufacturers.

9.3.2.5 Connection socket 5

Leakage input

Connection to an external leakage sensor for monitoring for possible leaks.

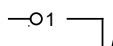
Pin	M12x1 (A-coded)	Assign- ments	Connection	Cable colour*	
1		Leak sensor		Brown	BN
2				White	WH
3		Ground (GND)		Blue	BU
4		–	–	Black	BK

Table 16: Connection socket 5

* Applies to cable colours of Lutz-Jesco GmbH cables. No liability is accepted for cables from other manufacturers.

9.3.2.6 Power output connection socket

The dosing pump forwards an analogue output signal via the power output connection socket. The current value of this signal is proportional to the display of the delivery capacity. With 0% delivery capacity, 0 or 4 mA is registered. With 100% delivery capacity, the output signal amounts to 20 mA.

This socket is not available in FEDOS LP-Net.

- 0/4 - 20 mA Signal
- Provided potential-free contact
- Working resistance: 500 ohms

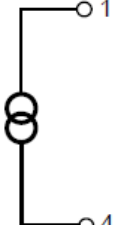
Pin	M12x1 (A-coded)	Assignments	Connection	Cable colour	
1		(+) 0/4 - 20 mA		Brown	BN
2		–		White	WH
3		–		Blue	BU
4		Analogue (GND)		Black	BK

Table 17: Power output connection socket

9.3.2.7 Ethernet connection port (only FEDOS LP-Net)

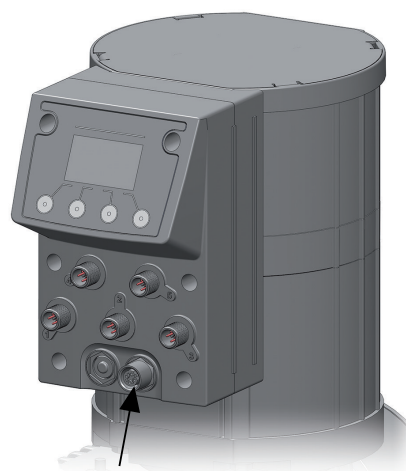


Fig. 10: Ethernet connection socket

The network connection socket makes it possible to control the stroke frequency and the number of strokes. In addition, all fault messages and status messages can be transmitted in the opposite direction. The dosing pump has a network input in the form of a 4-pole, D-coded M12x1 female connector. Lutz-Jesco GmbH offers different lengths of special twisted-pair network cables to make the typical Ethernet RJ-45 plug connection. If you use third-party cables, choose a Category 3 cable with an impedance of 100 Ohm or above.

- Modbus TCP/IP protocol
- 10 Mbps

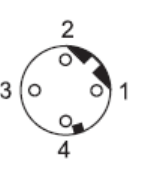
Pin	M12x1 (A-coded)	Assignments	Connection
1		TX+	Pair 1
2		RX+	Pair 2
3		TX-	Pair 1
4		RX-	Pair 2
-		Screen	

Table 18: Ethernet connection socket

9.3.2.7.1 Installing a wired network

During installation, observe the following points:

- The Ethernet is cabled in a star topology. The maximum cable length is 100 m.
- You must route separately as a bundle the different categories of cables (e.g. power supply, data lines and sensitive lines for measuring purposes). In this connection, cables should cross at an angle of 90°.
- There must either be a minimum distance between the power cable and data lines of 10 cm or you must install a partition or route the data line in a metal pipe. If this is not possible, use separate cable support systems.
- Only use screened cables and plug-in connectors.
- Route copper wires outside cable support systems through plastic pipes.
- Temperatures that are too high or too low result in lower mechanical and electrical loading or lead to damage.
- Data lines must only be subjected to a defined tensile load; otherwise, the electrical or attenuation values can no longer be guaranteed.
- When pulling cables out of the cable drum, avoid looping or pulling over sharp edges.
- With copper wires, implement potential equalization; when doing this, differentiate between hazardous and non-hazardous areas.
- Electrical, magnetic and electromagnetic fields affect signal transmission and under some circumstances can destroy electronic components.

10 Operation

10.1 Operator controls of the control unit

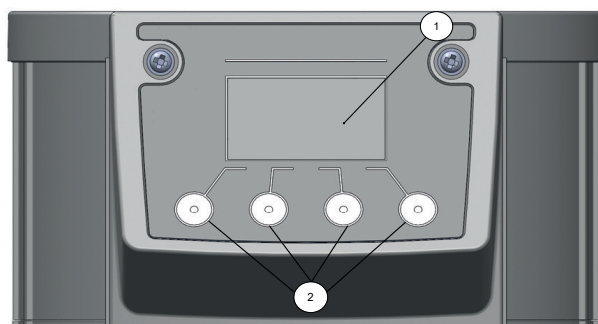


Fig. 11: Operator controls of the control unit

- 1 Graphic display 2 Four multifunction keys

You operate the dosing pump using the four keys below the display. The keys have different assignments depending on where you are located at any one time in the menu structure. The system shows the respective functions of the keys at the bottom of the display:

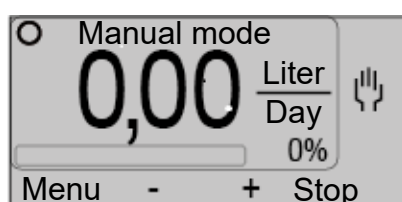


Fig. 12: Function assignments of the multifunction keys

In this example, the first key from the left has the **Menu** function; the second one has the **-** function; the third one has the **+** function and the fourth one has the **Stop** function.

The **+** and **-** selection keys as well as the **↑** and **↓** keys have a repeat function, i.e. if you keep them pressed down, the system automatically repeats the key function.

The display brightness reduces 45 seconds after your last input.

Two minutes after your last input, the control unit goes back to the start screen of the selected operating mode in each case.

i INFORMATION

The dosing pump does not have an ON/OFF switch. After being disconnected from the power supply, the dosing pump starts in the operating mode and configuration that you selected last.

10.2 Explanation of menu navigation

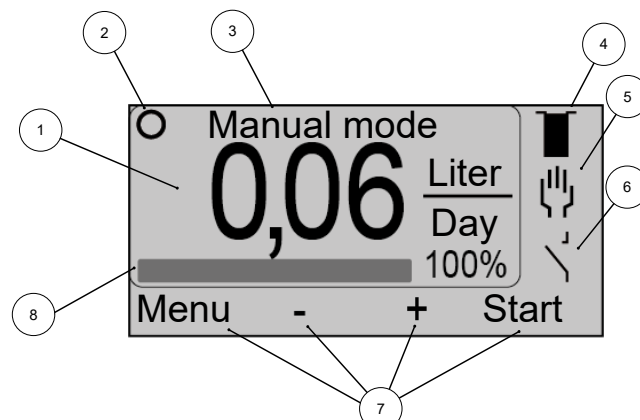


Fig. 13: Representation of the control unit on the display

1 Calculated delivery capacity (units per minute, hour or day)	2 Symbol for the dosing status display
3 Designation of active operating mode	4 Symbol for level control
5 Symbol for the active operating mode	6 Symbol for external ON/OFF
7 Variable assignment of the four menu keys on the dosing pump	8 Bar for representing the stroke frequency or delivery capacity

10.3 Explanation of the menu icons

10.3.1 Dosing status display

Symbol	Meaning
	Piston stationary (no dosing stroke)
	Piston moving (dosing stroke is performed)

Table 19: Dosing status display

10.3.2 Level control

Symbol	Meaning
	Dosing tank full
	Dosing tank at minimum (alert)

Symbol	Meaning
	Dosing tank empty (main alarm)

Table 20: Level control

10.3.3 Operating modes

Symbol	Meaning
	Manual mode
	Analogue input
	Pulse input
	Batch mode (Type Interval/Timer)
	Network mode (LP-Net only)

Table 21: Operating modes

10.3.4 Release input

Symbol	Meaning
	Contact open

Symbol	Meaning
	Contact closed

Table 22: Release input

10.3.5 Release code

Symbol	Meaning
	Password protection active

Table 23: Release code

10.4 Menu settings at initial commissioning

On first connecting the dosing pump to the mains or resetting it to the factory default setting, it is automatically in the *Language* menu (menu 6.3).

Now you can set the menu language.

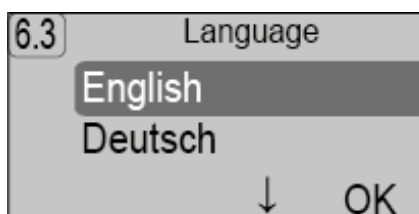


Fig. 14: Language

1. Use the  or  key to choose a language.
2. Press **OK**.
↳ The dosing pump displays menu 6, *System setup*.
3. Press **Menu**.
↳ The dosing pump displays menu 1 *Main menu*.
4. Press **Back**.
↳ The dosing pump displays the start screen. In the factory default setting, the *Manual operating* mode is preset and saved with a stroke frequency of 0 % (no dosing).

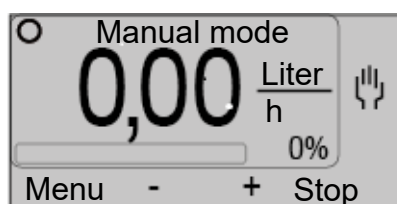


Fig. 15: Start screen of the dosing pump after initial commissioning

10.5 Main menu

► Press **Menu**.

↳ The dosing pump displays menu 1 *Main menu*.

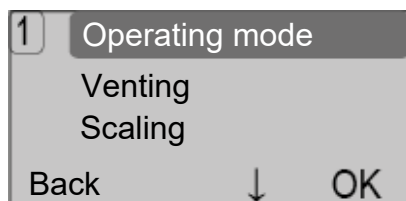


Fig. 16: Main menu

The main menu lists the main functions of the dosing pump:

- Operating mode
- Venting
- Scaling
- Calibration
- System setup (see System set-up ► 29)
- Info
- Messages

10.6 System set-up

In the *System setup* menu item, you configure all the dosing parameter's general parameters that do not depend on an operating mode.

1. Press **Menu**.

2. Use **↑** or **↓** to choose the *System setup* menu item and press **OK**.

↳ The dosing pump displays the *System setup* menu.

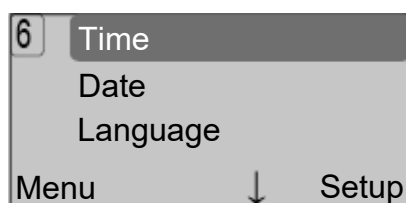


Fig. 17: System setup menu

10.6.1 Menu item "Language"

► Use **↑** or **↓** to choose the *Language* menu item and press **Setup**.

↳ You can choose from the following options:

- English (Factory default setting)
- German
- Francais
- Espanol
- Portugues
- Polish
- Netherlands

► Use the **↑** or **↓** key to choose a language and press **OK**.

☞ The language is set.

10.6.2 Menu item "Units"

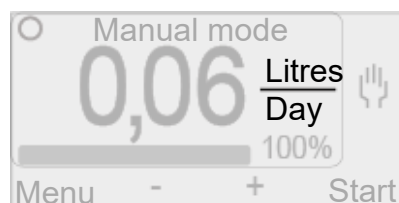


Fig. 18: Display of the unit of delivery capacity

► Use **↑** or **↓** to choose the *Units* menu item and press **Setup**.

↳ You can choose from the following units:

- Litres/Day
- Litres/h
- USgal/Day (American gallons)
- USgal/h (American gallons)
- I.gal/Day (Imperial gallons)
- I.gal/h (Imperial gallons)
- ml/min.

► Use **↑** or **↓** to choose the desired unit and press **OK**.

☞ The unit is set.

10.6.3 Menu item "Fault messages"

Faults to the dosing pump can be notified externally using the fault reporting function. This can be performed using fault reporting relays or fault reporting optocoupler. When activating the fault reporting optocoupler in the menu, the relays will also be activated and can be used in parallel.

► Use **↑** or **↓** to choose the *Fault message* menu item and press **Setup**.

↳ You can choose from the following options:

- not active (factory default setting)
- NO relay Collective alarm relay
- NC relay (Opener)
- Optocoupler N.O. Collective alarm relay
- Optocoupler N.C. (Opener)

► Use **↑** or **↓** to select the desired function and press **OK**.

☞ Fault message set.

10.6.3.1 Configuring the fault reporting relay

NO relay

Situation		Alarm relay output		Relays
Power supply	Fault	Pins 1/4	Pins 2/4	
No	No	closed	open	inactive
	Yes	closed	open	inactive
Yes	No	closed	open	inactive

Situation		Alarm relay output		Relays
Power supply	Fault	Pins 1/4	Pins 2/4	
	Yes	open	closed	active

Table 24: Configuration of NO relay

NC relay

Situation		Alarm relay output		Relays
Power supply	Fault	Pins 1/4	Pins 2/4	
No	No	closed	open	inactive
	Yes	closed	open	inactive
Yes	No	open	closed	active
	Yes	closed	open	inactive

Table 25: Configuration of NC relay

10.6.3.2 Configuring the fault reporting optocoupler**i INFORMATION**

The optocoupler only switches with the supply voltage on.

Situation		Output
Optocoupler function	Fault	Pins 1/2 (socket 1)
N.O.	No	open
	Yes	closed
N.C.	No	closed
	Yes	open

Table 26: Configuring fault reporting optocoupler

10.6.4 Menu item “Level input”

Level control of the dosing medium feed on the suction side with two alarm stages: Alert and main alarm

- Use or to choose the *Level input* menu item and press **Setup**.

↳ You can choose from the following options:

- *not active* (factory default setting)
 - *Alarm = contact* (issues an alarm when the float contact is closed)
 - *Alarm = open* (issues an alarm when the float contact is open; setting for standard level control systems from Lutz-Jesco GmbH)
- Use or to select the desired function and press **OK**.

Level input set.

i INFORMATION

The system displays the selected setting of the level input as an icon on the start screen of each operating mode.

“Level input” configuration

Status	Display	Level input		Dosing pump
		Alarm = contact	Alarm = open	
Tank full				Running
Tank at minimum (low level alert)				Running
Tank empty (main alarm)				Stopped

Table 27: Level input configuration

10.6.5 Menu item “Release input”

Option of starting or stopping the dosing pump externally.

- Use or to choose the *Release input* menu item and press **Setup**.

↳ You can choose from the following options:

- *not active* (factory default setting)
 - *Run = contact* (enables the dosing pump if both contacts are closed)
 - *Run = open* (enables the dosing pump if both contacts are open)
- Use or to select the desired function and press **OK**.

Release input is set.

i INFORMATION

The system displays the selected setting of the release input as an icon on the start screen of each operating mode.

10.6.6 Menu item “Dosing control”

With FLOWCON LP2 as optional accessories, the flow of the dosing medium is monitored after the stroke of the dosing pump.

1. Use **↑** or **↓** to choose the *Dosing control* menu item and press **Setup**.
2. Use **Mode** to activate the FLOWCON contact.
3. Press **Stop**.
4. Press **Setup** to set the faulty strokes. The factory setup of the dosing pump is set to 5 strokes. That means that an error message will be issued after 4 faulty strokes.
5. Use **+** and **-** to set the desired value. Adjustment range: 0 - 100 faulty strokes.
6. Press **OK**.
7. Press **Back**.

☞ Dosing control is set.

Follow the operating instructions for the FLOWCON LP 2 flow meter. It contains instructions regarding operation using the dosing pump.

10.6.7 Menu item "Factory default"

Resets the dosing pump's control unit settings to the factory default setting.

1. Use **↑** or **↓** to choose the *Factory default settings* menu item and press **Setup**.
2. Press **OK**.

↳ The dosing pump displays the *Language* menu (menu 6.3).

☞ The dosing pump is reset to the factory default setting.

10.6.8 Menu item "User setup"

This menu item allows you to save your dosing pump settings.

10.6.8.1 Saving own settings

1. Use **↑** or **↓** to choose the *User setup* menu item and press **Setup**.
2. Use **↑** or **↓** to choose *Save* and press **OK**.

☞ Own settings saved.

10.6.8.2 Loading own settings

1. Use **↑** or **↓** to choose the *User setup* menu item and press **Setup**.
2. Use **↑** or **↓** to choose *Load* and press **OK**.

☞ Own settings loaded.

10.6.9 Menu item "Current output"

This menu item allows you to set the analogue output signal at the power output connection socket.

- Use **↑** or **↓** to choose the *Current output* menu item and press **Setup**.

↳ You can choose from the following options:

- *Off* (factory default setting)
- 0...20 mA
- 4...20 mA

- Use **↑** or **↓** to choose the desired option and press **OK**.

☞ Current output is set.

i NOTE

To save energy when the current output is not used, set the function to *Off*.

10.6.10 Set "IP address" menu item (LP-Net only)

This menu item allows you to set the network address. Your local network administrator specifies the address. It is not possible to set up a subnet, a proxy or a gateway.

1. Use **↑** or **↓** to choose the *IP address* menu item and press **Setup**.
2. Use the **+** and **-** keys to set a value of 001 to 255 for the first digit of the IP address and then press **Continue**.
3. Proceed as described under point 2 for the other digits of the IP address.
4. Press **Back**.

☞ IP address is set.

10.6.11 Menu item "Time"

1. Use **↑** or **↓** to choose the *Time* menu item and press **Setup**.
2. Use the **+** and **-** keys to set the desired hour and press **Continue**.
3. Use the **+** and **-** keys to set the desired minute.
4. Press **Back**.

☞ The time is set.

10.6.12 Menu item "Date"

1. Use **↑** or **↓** to choose the *Date* menu item and press **Setup**.
2. Use the **+** and **-** keys to set the desired day and press **Continue**.
3. Use the **+** and **-** keys to set the desired month and press **Continue**.
4. Use the **+** and **-** keys to set the desired year and press **Continue**.
5. Use the **+** and **-** keys to set the desired day of the week.
6. Press **Back**.

☞ The date is set.

i INFORMATION

If you wish to use the *batch mode* function of the dosing pump FE-DOS LP, you need to set the correct day of the week.

10.6.13 Activating the Release code

If the *release code* is activated, operation of the dosing pump is blocked. You can only perform settings after entry of the correct *release code*.



WARNING

Caustic burns or other burns through dosing media!

If the release code is activated, operation of the dosing pump is blocked. If a dosing pump has been started without the Release code being entered, it can only be stopped by means of the power supply. In unfavourable cases, if the user has inadvertently activated or forgotten the release code, the dosing pump cannot be quickly stopped and injuries may result.

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

The *Release code* can be set to any number between 0001 and 9999.

1. Use $\uparrow$ or $\downarrow$ to choose the *Release code* menu item and press **Setup**.

↳ The dosing pump displays menu 6.10 *Release code*.

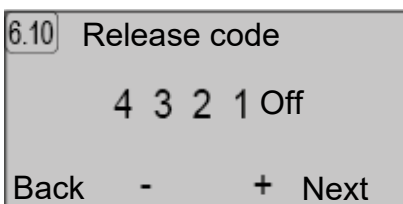


Fig. 19: Release code

2. Use the $+$ and $-$ keys to set a value of 0 to 9 for the first digit of the
3. code and then press **Continue**.
4. Proceed as described under point 2 for the other digits.
5. Choose the last item *Off* and press $+$.
6. Press **Back**.

↳ The Release code is activated. The dosing pump displays the corresponding symbol:

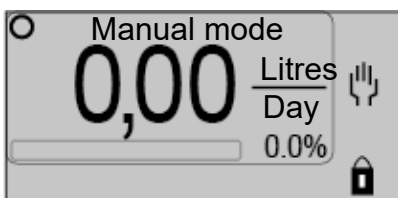


Fig. 20: Start screen with activated Release code

- 🔒 Release code activated.

10.6.13.1 Entering the Release code

As soon as any key is pressed, the *Release code* must be entered. If you enter the code correctly, you have 120 seconds in which to operate the dosing pump. After 120 seconds have elapsed, the *Release code* must be re-entered, even if an entry is currently being made (settings in the menus are excluded from this).

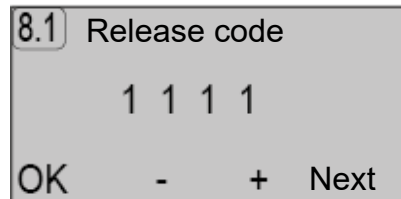


Fig. 21: Entering the Release code

1. Use the $+$ and $-$ keys to set a value of 0 to 9 for the first digit of the code and then press **Continue**.
2. Proceed as described under point 1 for the other digits.
3. After entering all the digits, press **OK**.

↳ If your input is correct, the dosing pump displays the start screen.

- 🔒 Release code entered.



INFORMATION

If you have forgotten the code, please contact the manufacturer.

10.6.13.2 Deactivating the Release code

1. Press **Menu**.
2. Use $\uparrow$ or $\downarrow$ to choose the *System setup* menu item and press **OK**.
3. Use $\uparrow$ or $\downarrow$ to choose the *Release code* menu item and press **Setup**.

4. Press **Continue** until *On* is selected.

5. Press $-$.

6. Press **Back**.

- 🔒 Release code deactivated.

10.6.14 Activating the safety code

Protect the *System setup* menu from unauthorized access.

You can set any safety code you like from 0001 to 9999.

1. Use $\uparrow$ or $\downarrow$ to choose the *Safety code* menu item and press **Setup**.

↳ The dosing pump displays menu 6.11 *Safety code*.

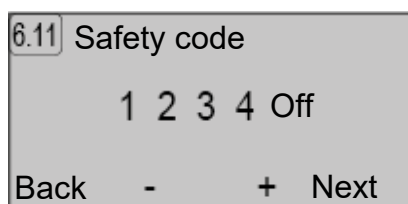


Fig. 22: Safety code

- Use the **+** and **-** keys to set a value of 0 to 9 for the first digit of the code and then press **Continue**.
- Proceed as described under point 2 for the other digits.
- Choose the last item *Off* and press **+**.
- Press **Back**.

↳ The safety code is activated. You must enter it when accessing the System setup menu.

☞ The safety code activated.

10.6.14.1 Entering the safety code



Fig. 23: Entering the safety code

- Use the **+** and **-** keys to set a value of 0 to 9 for the first digit of the code and then press **Continue**.
- Proceed as described under point 1 for the other digits.
- After entering all the digits, press **OK**.

↳ After correct entry, the dosing pump displays the *System setup* menu.

☞ Safety code entered.



INFORMATION

If you have forgotten the code, please contact the manufacturer.

10.6.14.2 Deactivating the safety code

- Press **Menu**.
- Use **↑** or **↓** to choose the *System setup* menu item and press **OK**.
- Enter the correct safety code and press **OK**.
- Use **↑** or **↓** to choose the *Safety code* menu item and press **Setup**.
- Keep pressing **Continue** until *On* is selected.
- Press **-**.
- Press **Back**.

☞ The safety code deactivated.

10.7 Information about the dosing pump

In the *Info* menu item, you can find a wide range of information about the dosing pump.

- Press **Menu**.
- Use **↑** or **↓** to choose the *Info* menu item and press **OK**.
 - ↳ The dosing pump displays menu 7.1 *Info 1*.

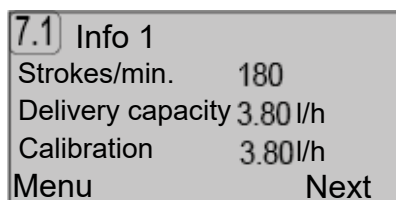


Fig. 24: Display of menu Info

- Press **Continue** repeatedly to access the *Info* menus.

↳ The *Info* menus display the following information:

Menu	Information
<i>Info 1</i>	- Maximum strokes/minute - Maximum delivery capacity in l/hr - Calibrated delivery capacity in l/hr
<i>Info 2</i>	- Stroke volume at factory setting in ml - Stroke volume after calibration in ml
<i>Info 3</i>	- Running time of the dosing pump in hrs. - Total strokes of the dosing pump carried out
<i>Info 4</i>	- Software version and date of update - Part number - Serial number
<i>Info 5</i>	- Current value in mA at analogue input - Date and time
<i>Info 6</i>	- MAC number - IP number
<i>Info 7</i>	Assignment of connection socket 1
<i>Info 8</i>	Assignment of connection socket 2
<i>Info 9</i>	Assignment of connection sockets 2 and 3
<i>Info 10</i>	Assignment of connection socket 4
<i>Info 11</i>	Assignment of connection socket 5

Table 28: Explanation of the Info menus

- Press **Menu** to exit the *Info* menu.

☞ The information was displayed.

10.8 Messages of the control unit

The system logs the disturbance messages of the dosing pump with the date, time and error code.

For a list of all possible fault messages and their meanings, see Troubleshooting [► 49].



Fig. 25: Display of disturbance messages

The following symbols are used:

Symbol	Meaning
	Symbol for an event
	Symbol for the start of a message
	Symbol for the end of a message

Table 29: Explanation of the menu icons - disturbance messages

1. Press **Menu**.
2. Use **↑** or **↓** to choose the *Messages* menu item and press **OK**.
3. Press **↑** or **↓** repeatedly to view the fault messages, which are listed in chronological order.
4. Press **Menu** to exit the *Messages* menu.

Deleting the messages of the control unit

1. Press **Menu**.
2. Use **↑** or **↓** to choose the *Messages* menu item and press **OK**.
3. Press **Delete**.
4. Press **Delete** again.

The messages of the control unit are deleted.

11 Operation



WARNING

Caustic burns or other burns through dosing media!

After the mains supply has been connected, residual dosing media in the dosing head can spray out.

- ▶ 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 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 injury.

- ▶ 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.



NOTE

Overheating of the motor

If the fan cover is removed or is defective, insufficient motor cooling is provided.

- ▶ Before starting the dosing pump, ensure that the motor fan cover is fitted and fully functional.

11.1 Putting the dosing pump into operation

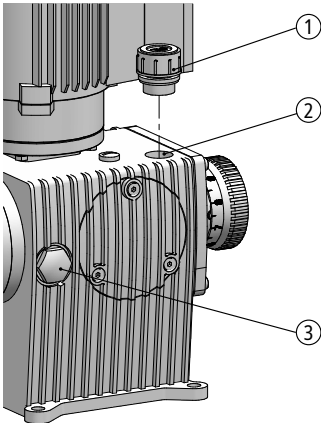


Fig. 26: Dosing pump oil inlet



INFORMATION

For initial commissioning, it is advisable to use water as the dosing medium to check that the system is leak-proof and that the dosing pump is functioning correctly. Check first whether undesirable reactions could occur between the actual dosing medium and the water.

Furthermore, it is advisable to prime the pump without back-pressure. For this purpose, we recommend installing a relief valve on the discharge side of the dosing pump.

FEDOS LP	Filling volume
05 – 30	0.25 l

Table 30: Amount of oil to be filled

- ✓ The dosing pump has been fitted and installed correctly.
- ✓ All the mechanical fastenings have been inspected to ensure adequate load-bearing capacity.
- ✓ The dosing head screws have been tightened with the correct torque.
- ✓ All the hydraulic sections have been inspected to ensure they are adequately leak-proof and that the through flow direction is correct.
- ✓ The drive motor and all associated additional equipment is checked for proper connection.
- ✓ Personnel have read all the operating instructions and understood them completely.
- ✓ Required equipment ✂ is to hand: Gear oil of viscosity class ISO-VG460 in accordance with DIN 51519 (corresponds to SAE 140 in accordance with DIN 51512).

1. Unscrew and remove the closing bolt (1) from the oil inlet (2).

- 2. Pour the oil into the oil inlet (→ Table 30: Amount of oil to be filled [► 35]). Check the oil level in the oil level glass (3) at the same time. The oil level should reach to the middle of the oil level glass.
- 3. Screw the closing bolt tight
- 4. Open the shut-off valves on the suction and discharge sides if present.
- 5. Connect the dosing pump to the power supply.
 - ↳ The dosing pump is ready for use.
- 6. Calibrating the dosing pump.
 - ☞ The dosing pump is commissioned.

11.1.1 Venting the dosing pump

The dosing head should be vented during initial commissioning or if gas bubbles are suspected, so as to improve the performance of the pump. The FEDOS LP is provided with the Vent function for this purpose, which sets the dosing pump to convey at maximum stroke length to fill/vent the lines and dosing head.

Perform the following working steps:

- 1. Press **Menu**.
- 2. Use **↑** or **↓** to choose the *Venting* menu item and press **OK**.
- 3. Press **Start** and hold down the button.
 - ↳ The dosing pump starts delivery at the highest stroke frequency.
- 4. Press and hold **Start** until you are able to detect a constant supply stream.
- ☞ The dosing pump is vented.

11.1.2 Scaling the delivery capacity

You can use the *Scaling* function to adjust the dosing pump flexibly to the local conditions during the start-up. Sometimes, a dosing pump model selected during the planning phase turns out to be too big. To minimise the risk of overdosing, the delivery capacity can be limited or scaled.

The reduced delivery capacity applies to all operating modes of the dosing pump. The setting is retained even after an interruption to the power supply. If the dosing pump has been calibrated, the percentually-restricted capacity refers to the actual output.

Perform the following working steps:

- 1. Press **Menu**.
- 2. Use **↑** or **↓** to choose the *Scaling* menu item and press **OK**.
- 3. Use the **+** and **-** buttons to set the desired delivery capacity in l/h and press **OK**.
 - ↳ The bar that indicates delivery capacity is now displayed in two parts:

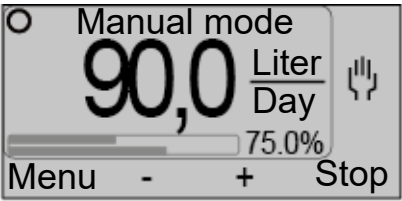


Fig. 27: Display with scaled delivery capacity

☞ Delivery capacity scaled.

Bar	Meaning
top	The scaled delivery capacity value (part of the delivery capacity in the factory setting)
bottom	The current delivery capacity expressed as a percentage of the scaled delivery capacity

Table 31: Meaning of the bars

i INFORMATION

To reverse scaling, set the delivery capacity in the *Scaling* menu to the value 0 or to the maximum possible value.

11.1.3 Calibrating the dosing pump

In dependence on the dosing medium you are using and the existing delivery pressure, you must match the theoretical delivery capacity with that which is actually measured. You use the *Calibration* function to do this.

Perform the following working steps:

- ✓ The plant sections on the discharge side of the dosing pump have been installed correctly and are ready for operation.
- 1. Fill the metering container with the dosing medium.
- 2. Hold the end of the dosing pump's suction line in the metering container.
- 3. Vent the dosing pump.
- 4. Press **Menu**.
- 5. Use **↑** or **↓** to choose the *Calibration* menu item and press **OK**.
 - ↳ The dosing pump displays menu 5 *Calibration*.

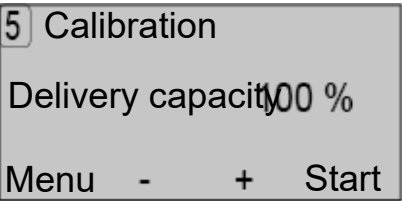


Fig. 28: Menu 5 Calibration

- 6. Use the **+** and **-** keys to set the percentage value of the delivery capacity with which you want to carry out calibration. Setting range 10% – 100%.
- 7. Press **Start**.

- ↳ The dosing pump starts delivery and displays the number of executed strokes.
- 8. Press **Finish** as soon as you have achieved a measurable value in the metering container.
 - ↳ The dosing pump stops and displays the theoretical value of the delivery rate in ml.

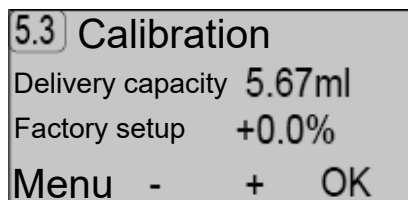


Fig. 29: Menu 5.3 Calibration 2

- 9. Read off the actual delivery rate from the metering container and use the **+** and **-** keys to correct the displayed delivery capacity. Adjustment range: -50% to +100%
- 10. Press **OK**.
 - ↳ The dosing pump is calibrated.

11.2 Operating modes

The dosing pump offers the following operating modes:

- Manual mode - Manual setting of the delivery rate
- Pulse input - Controlling the stroke frequency and number of strokes in dependence on the number of pulses and the pulse spacing
- Analogue input - Controlling the delivery capacity by means of a 0/4 – 20 mA signal
- Batch mode - Controlling the delivery capacity and the delivery rate by means of manual starting, an external pulse, at intervals or specified times in different modes
- Network mode (only FEDOS LP-Net) - Controlling the stroke frequency and number of strokes across a network.

11.2.1 Manual mode

11.2.1.1 Selecting the operating mode

1. Press **Menu**.
2. Use **↑** or **↓** to choose the *operating mode* menu item and press **OK**.
3. Use **↑** or **↓** to choose the *Manual mode* menu item and press **OK**.
 - ↳ The dosing pump displays the start screen of *Manual mode*.

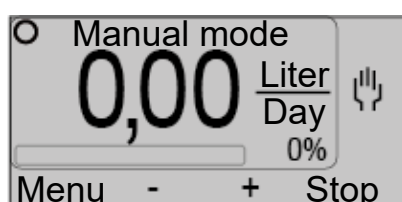


Fig. 30: Start screen of Manual mode

11.2.1.2 Starting the dosing pump

1. Press the **+** key to increase the stroke frequency by 0.1 %.
 - ↳ The dosing pumps starts dosing immediately. The system automatically calculates the resulting delivery capacity and displays it.
2. Use the **+** and **-** keys to set the desired stroke frequency.
 - ↳ Dosing pump has started.

11.2.1.3 Stopping the dosing pump

- ▶ Press **Stop**.
 - ↳ The "Stop" signal displays and **Stop** changes to **Start**. Press **Start** to restart the dosing pump.
- ↳ Dosing pump stopped

i INFORMATION

Pressing Menu does not interrupt dosing! You do not stop the dosing pump until you change to a different operating mode.

11.2.2 Pulse input

In *Pulse input* operating mode, the stroke frequency and number of strokes of the dosing pump are controlled depending on the number of pulses and the pulse interval of the pulse signal applied to the pulse input.

11.2.2.1 Selecting the operating mode

1. Press **Menu**.
2. Use **↑** or **↓** to choose the *Operating mode* menu item and press **OK**.
3. Use **↑** or **↓** to choose the *Pulse input* menu item and press **OK**.
 - ↳ The dosing pump displays the current configuration of the parameters for this operating mode (menu 3.31).

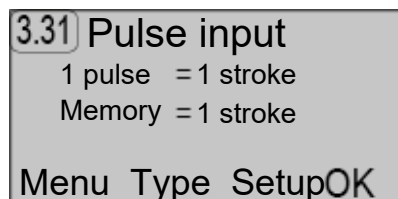


Fig. 31: Parameters for pulse input operating mode

4. Press **OK**.
 - ↳ The dosing pump displays the start screen of *Pulse input* mode.

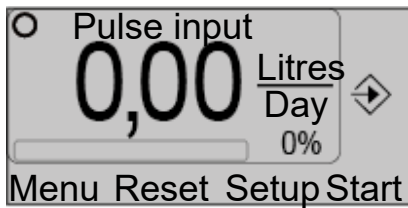


Fig. 32: Start screen of Pulse input

11.2.2.2 Choose the type

The following types are available in pulse input operating mode:

Type	Explanation
<i>Strokes</i>	Transmission and reduction of the number of pulses compared to the number of strokes
<i>Delivery rate</i>	Delivery of a fixed output per pulse
<i>Water meter</i>	Operation on a contact-type water meter

Table 32: Explanation of pulse input modes

i INFORMATION

The system marks the currently active mode by displaying *(On)* after the menu item. In the factory default setting, the *Strokes* mode is preselected: *Strokes (On)*.

- Press **Setup**.
↳ The dosing pump displays the current configuration of the parameters for this operating mode (menu 3.31).
- Press **Mode**.
- Use **↑** or **↓** to choose a type and press **OK**.
↳ The dosing pump displays the current configuration of the parameters for this operating mode (menu 3.31).
- Press **OK**.
↳ The dosing pump displays the start screen of *Pulse input* mode.

11.2.2.3 Pulse input modes

The parameters that you can set are different depending on the mode.

Strokes

The pulse input type *Strokes* offers the following configuration options:

Parameter	Explanation
<i>Strokes p. pulse</i>	Specifies the required number of strokes that the dosing pump carries out per pulse. In this connection, the system determines the stroke frequency on a dynamic basis based on the time between the last two pulses. Stroke frequency = number of strokes/pulse spacing Default settings: 1 stroke Adjustment range: 1 - 999 strokes
<i>Pulses p. stroke</i>	Specifies the required number of pulses that must be connected to the input to trigger a stroke. Default setting: 1 pulse Adjustment range: 1 – 999 pulses
<i>Stroke buffer</i>	The strokes that have still to be executed are saved in the stroke buffer. If stroke multiplication is set, the system writes all the strokes belonging to one pulse into the stroke buffer. With each pulse, the number of strokes in the accumulator increases; with each executed stroke, it decreases. The limit of the stroke buffer must be raised to save pulse requests that arrive during execution of the strokes from the previous pulse request. If the number of requested strokes exceeds the stroke buffer capacity, the system issues a "Stroke buffer maximum" message. Default setting: 1 stroke Adjustment range: 1 - 999 strokes

Table 33: Strokes configuration type

i INFORMATION

In the case of pulse multiplication, you must increment the stroke buffer manually. Otherwise, the configuration cannot be confirmed with **OK**.

You can configure parameters Strokes per pulse and Pulses per stroke at the same time to define an exact number of strokes for a number of pulses. In this connection, the system determines the stroke frequency on a dynamic basis based on the time between the last two pulses.

Example:

If you set 7 strokes per pulse and 3 pulses per stroke, the dosing pump carries out 7 strokes per 3 input pulses.

Delivery rate

The *Output* pulse input mode offers the following configuration options:

Parameter	Explanation
<i>Delivery rate</i>	Specifies the required output per pulse in ml. The output is calculated from the dosing pump's stroke volume after calibration and the automatically calculated ratio of the number of strokes to the number of pulses. The value that is displayed in brackets indicates the number of strokes and pulses (number of strokes/number of pulses).
<i>Stroke buffer</i>	The strokes that have still to be executed are saved in the stroke buffer. If stroke multiplication is set, the system writes all the strokes belonging to one pulse into the stroke buffer. With each pulse, the number of strokes in the accumulator increases; with each executed stroke, it decreases. The limit of the stroke buffer must be raised to save pulse requests that arrive during execution of the strokes from the previous pulse request. If the number of requested strokes exceeds the stroke buffer capacity, the system issues a "Stroke buffer maximum" message. Default setting: 1 stroke Adjustment range: 1 - 999 strokes

Table 34: Output configuration mode



INFORMATION

The delivery capacity depends on the dosing pump's delivery pressure. To display the delivery capacity correctly, you must calibrate the dosing pump.

Water meter

The *Water meter* pulse input mode offers the following configuration options:

Parameter	Explanation
<i>Delivery rate</i>	You can specify the delivery rate per pulse in millilitres (ml), parts per million (ppm) and per cent (%). After selecting the unit, you can set the value. Specifies the required delivery rate of the dosing pump per cubic metre (m ³) of flow from the water meter, given in ml. The value corresponds to the throughflow amount per pulse. Since the dosing pump only controls the output via the stroke frequency, you must set the cycle between the water meter pulse and the dosing pump's stroke. The value that is displayed in brackets indicates the number of strokes that must be triggered per number of water meter pulses. (Number of strokes/number of pulses). Default setting: Per cent

Parameter	Explanation
<i>Stroke buffer</i>	The strokes that have still to be executed are saved in the stroke buffer. If stroke multiplication is set, the system writes all the strokes belonging to one pulse into the stroke buffer. With each pulse, the number of strokes in the accumulator increases; with each executed stroke, it decreases. The limit of the stroke buffer must be raised to save pulse requests that arrive during execution of the strokes from the previous pulse request. If the number of requested strokes exceeds the stroke buffer capacity, the system issues a "Stroke buffer maximum" message. Default setting: 1 stroke Adjustment range: 1 - 999 strokes
<i>ml/pulse</i>	Specifies the water meter's throughflow amount per pulse in ml. Default setting 100 ml/pulse.
<i>l/pulse</i>	Specifies the water meter's throughflow amount per pulse in l.
<i>m³/pulse</i>	Specifies the water meter's flow volume per pulse in m ³ .
<i>Maximum</i>	Specifies the water meter's maximum flow volume in m ³ /h Default setting: 0.2 m ³ /h
<i>Concentration</i>	Sets the concentration of the dosing medium. This specification is required for pumping in accordance with ppm and %. Default setting: 100%
<i>Duration</i>	Continuous operation or dosing controlled via the water meter. Default setting: On
<i>Batch</i>	Batch dosing controlled via the water meter.

Table 35: Water meter configuration mode



INFORMATION

The parameters *Duration* and *Batch* are only displayed if the delivery rate is specified in ppm or per cent.

On the basis of the water meter's values (*ml/pulse*, *l/pulse* or *m³/pulse*) and the delivered dosing capacity (output), the dosing pump automatically determines the stroke frequency. If the dosing pump's maximum output is exceeded during a fast sequence of pulses, the system issues a warning message.



INFORMATION

Conflicting parameter inputs are displayed when trying to save (menu 3.41). It is not possible to activate the operating mode without correcting the parameters.

11.2.2.4 Configuring the pulse input mode

1. Press **Setup**.
 - ↳ The dosing pump displays the current configuration of the parameters for this operating mode (menu 3.31).
2. Press **Setup**.
3. Use **↑** or **↓** to choose a parameter of the type and press **OK**.
4. Press the **+** key to increment the parameter's value or the **-** key to decrement it.
5. Press **OK**.
 - ↳ The dosing pump displays the current configuration of the parameters for this operating mode (menu 3.31).
6. Press **OK**.
 - ↳ The dosing pump displays the start screen of *Pulse input* mode.

11.2.2.5 Starting the dosing pump

- ✓ The dosing pump is connected.
1. Press **Start**.
 2. Supply a pulse to the pulse input of the dosing pump.
 - ↳ The dosing pumps starts dosing immediately. The system automatically calculates the resulting delivery capacity and displays it.
- ☞ Dosing pump has started.

11.2.2.6 Stopping the dosing pump

- ▶ Press **Stop**.
- ☞ Dosing pump has stopped.

11.2.2.7 Clearing the stroke buffer

- ▶ Press **Reset**.
 - ↳ All the strokes in the accumulator that are still pending are deleted. The dosing pump stops; however, it is still active and waiting for the next pulse.
- ☞ The stroke buffer has been cleared.

11.2.3 Analogue input

In *Analogue input* operating mode, an external 0/4 – 20 mA signal, which is connected to the analogue input, controls the stroke frequency.

11.2.3.1 Selecting the operating mode

1. Press **Menu**.
2. Use **↑** or **↓** to choose the *Operating mode* menu item and press **OK**.
3. Use **↑** or **↓** to choose the *Analogue input* menu item and press **OK**.
 - ↳ The dosing pump displays the current configuration of the parameters for this operating mode (menu 3.21).

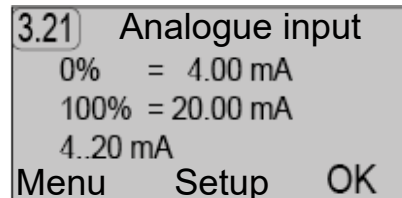


Fig. 33: Parameters of analogue operating mode

4. Press **OK**.
 - ↳ The dosing pump displays the start screen of the *Analogue input* operating mode.



Fig. 34: Analogue input start screen

11.2.3.2 Setting the signal mode

You have the option of setting a 0 - 20 mA signal or a 4 - 20 mA one.

1. Press **Setup**.
 - ↳ The dosing pump displays the current configuration of the parameters for this operating mode (menu 3.21).
 2. Press **Setup**.
 3. Use **↑** or **↓** to choose the *0/4...20mA* menu item and press **Setup**.
 4. Press **Mode** to set 0 - 20 mA or 4 - 20 mA.
 5. Press **OK**.
 - ↳ The dosing pump displays the current configuration of the parameters for this operating mode (menu 3.21).
 6. Press **OK**.
 - ↳ The dosing pump displays the start screen of the *Analogue input* operating mode.
- ☞ The signal mode is set.

11.2.3.3 Setting the current value for 0 % delivery capacity

1. Press **Setup**.
 - ↳ The dosing pump displays the current configuration of the parameters for this operating mode (menu 3.21).
2. Press **Setup**.

3. Use **↑** or **↓** to choose the *0% current* menu item and press **Setup**.
 4. Use the **+** and **-** keys to set the desired current value. Admissible values are in the range 0.00 - 20.00 mA. The value that is displayed in brackets indicates the actual connected current value.
 5. Press **OK**.
 - ↳ The dosing pump displays the current configuration of the parameters for this operating mode (menu 3.21).
 6. Press **OK**.
 - ↳ The dosing pump displays the start screen of the *Analogue input* operating mode.
- ☞ The current value for 0 % delivery capacity is set.

11.2.3.4 Setting the current value for 100 % delivery capacity

1. Press **Setup**.
 - ↳ The dosing pump displays the current configuration of the parameters for this operating mode (menu 3.21).
2. Press **Setup**.
3. Use **↑** or **↓** to choose the *100% current* menu item and press **Setup**.
4. Use the **+** and **-** keys to set the desired current value. Admissible values are in the range 0.00 - 20.00 mA. The value that is displayed in brackets indicates the actual connected current value.
5. Press **OK**.
 - ↳ The dosing pump displays the current configuration of the parameters for this operating mode (menu 3.21).
6. Press **OK**.
 - ↳ The dosing pump displays the start screen of the *Analogue input* operating mode.

i INFORMATION

To process a 20 - 4 mA (inverted) analogue signal, you must configure parameter *0% current* to 20 mA and parameter *100% current* to 4 mA.

- ☞ The current value for 100 % delivery capacity is set.

11.2.3.5 Starting the dosing pump

- ✓ The dosing pump is connected.
1. Press **Start**.
 - ↳ The dosing pump starts dosing immediately. The system automatically calculates the resulting delivery capacity and displays it.
- ☞ Dosing pump has started.

11.2.3.6 Stopping the dosing pump

- ▶ Press **Stop** or reduce the incoming signal to the value for *0% current* or less.

i INFORMATION

If the signal value is below 4 mA with a 4 - 20 mA signal, an the error message "Analogue input error" will be displayed.

- ☞ Dosing pump has stopped.

11.2.4 Batch mode

In *batch mode*, the stroke frequency and number of strokes of the dosing pump are controlled depending on the required delivery rate. You can set the output on an individual basis for the dosing pump's run time, number of strokes and delivery capacity (stroke frequency). It is started either manually or via a pulse signal applied at the pulse input. Dosing is possible at intervals or at specified times in the course of a week.

11.2.4.1 Selecting the operating mode

1. Press **Menu**.
2. Use **↑** or **↓** to choose the *Operating mode* menu item and press **OK**.
3. Use **↑** or **↓** to choose the *batch mode* menu item and press **OK**.
 - ↳ The dosing pump displays the current configuration of this operating mode's parameters.

3.41 Batch mode
Start/Stop
100 strokes
Delivery rate 35.2 ml
Menu TypeSetup OK

Fig. 35: Parameters of batch mode operating mode

4. Press **OK**.
 - ↳ The dosing pump displays the start screen of *Batch mode*.

11.2.4.2 Choosing the batch mode type

The following types are available in *batch mode*:

Type	Explanation
<i>Start/Stop</i>	Manual starting of dosing.
<i>Ext Start</i>	Dosing is started externally.
<i>Interval</i>	Dosing is started automatically at regular intervals.
<i>Timer</i>	Starting of dosing at a specific time.

Table 36: Batch mode types

i INFORMATION

The currently active type is indicated by *(On)* after the menu item. In the factory default setting, the *Start/Stop* mode is preselected: *Start/Stop (On)*.

1. Press **Setup**.
 - ↳ The dosing pump displays the current configuration of this operating mode's parameters.
2. Press **Mode**.
3. Use **↑** or **↓** to choose a type and press **OK**.
 - ↳ The dosing pump displays the current configuration of this operating mode's parameters.
4. Press **OK**.
 - ↳ The dosing pump displays the start screen of *Batch mode*.

11.2.4.3 Batch mode types

The adjustable parameters differ depending on the type.

Start/Stop and Ext Start

Batch mode types *Start/Stop* and *Ext. Start* do not differ by virtue of the configuration; rather, the only difference is in the way in which that the dosing pump is started. They offer the following configuration options:

Parameter	Explanation
<i>Runtime</i>	Specifies the required runtime of the dosing pump; input in minutes. The value that is displayed in brackets indicates the calculated output.
<i>No. of strokes</i>	Specifies the number of required strokes. The value that is displayed in brackets indicates the calculated output.
<i>Delivery capacity</i>	Specifies the required stroke frequency stated as a percentage of the maximum stroke frequency.

Table 37: Start/Stop and Ext Start configuration

Interval

The *Interval* batch mode type offers the following configuration options:

Parameter	Explanation
<i>Runtime</i>	Specifies the required runtime of the dosing pump; input in minutes. The value that is displayed in brackets indicates the calculated output.

Parameter	Explanation
<i>No. of strokes</i>	Specifies the number of required strokes. The value that is displayed in brackets indicates the calculated output.
<i>Delivery capacity</i>	Specifies the required stroke frequency stated as a percentage of the maximum stroke frequency.
<i>Interval</i>	Specifies the interval at which dosing is to take place on a regular basis. The interval cannot be shorter than the specified or calculated runtime; if necessary, the system corrects it automatically to the minimum value.

Table 38: Interval configuration

The system displays the *Interval* type with a clock symbol and the time elapsing until the start of next dosing.

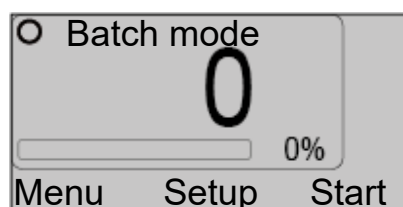


Fig. 36: Start screen of Interval batch mode type

Timer

Using the FEDOS LP dosing pump *Timer* batch mode, you can program two different dosing procedures for a period of one week.

You can provide one or two dosing procedure(s) for each day of the week which start at a specific time (this start time is repeated for each further dosing procedure of the same mode on other days of the week). You can therefore program up to 14 dosing procedures per week. You must specify for each day of the week if no dosing procedure, dosing procedure 1, dosing procedure 2, or both dosing procedures should be started after each other.

Apart from this, you must specify for each dosing procedure whether the dosing pump is to carry out dosing for a specific time or for a specific number of strokes.

You can configure the parameters below for dosing procedure 1:

- Start time 1
- Runtime 1
- Preset strokes 1
- Delivery capacity (applies to dosing procedures 1 and 2)
- Mo-Su

You can configure the parameters below for dosing procedure 2:

- Start time 2
- Runtime 2
- Preset strokes 2
- Delivery capacity (applies to dosing procedures 1 and 2)
- Mo-Su



INFORMATION

You must set the date, time and day of the week before configuring the parameters.

The batch mode *Timer* offers the following configuration options:

Parameter	Explanation
<i>Start time 1</i>	Specifies the required time for dosing procedure 1.
<i>Start time 2</i>	Specifies the required time for dosing procedure 2.
<i>Runtime 1</i>	Specifies the required run time of dosing procedure 1, stated in minutes. The bracket value in the display shows the calculated delivery rate (based on the setting in the <i>Delivery capacity</i> parameter).
<i>Runtime 2</i>	Specifies the required run time of dosing procedure 2, stated in minutes. The bracket value in the display shows the calculated delivery rate (based on the setting in the <i>Delivery capacity</i> parameter).
<i>Preset strokes 1</i>	Specifies the required number of strokes of dosing procedure 1. The value that is displayed in brackets indicates the calculated output.
<i>Preset strokes 2</i>	Specifies the required number of strokes of dosing procedure 2. The value that is displayed in brackets indicates the calculated output.
<i>Delivery capacity</i>	Specifies the required stroke frequency for both dosing procedures stated as a percentage of the maximum stroke frequency.
<i>Mo-Su</i>	Specifies the day of the week on which a specific dosing procedure is to be started.

Table 39: Timer configuration

11.2.4.4 Programming dosing operations

- Press **Setup**.
↳ The dosing pump displays the current configuration of this operating mode's parameters.
- Press **Setup**.
- Use the **↑** or **↓** to choose the *Start time 1* menu item and press **Setup**.

- Press the **+** key to increment the parameter's value or the **-** key to decrement it.
- Press **OK**.
- Use **↑** or **↓** to choose *Runtime 1* or *Strokes 1* and then press **Setup**.
- Press the **+** key to increment the parameter's value or the **-** key to decrement it.
- Press **OK**.
- Use **↑** or **↓** to choose the *Capacity* menu item and press **Setup**.
- Press the **+** key to increment the parameter's value or the **-** key to decrement it.
- Press **OK**.
↳ The dosing pump displays the current configuration of this operating mode's parameters.
- If required, also program the dosing procedure 2 with the parameters *Start time 2*, *Runtime 2* or *Strokes 2*.
- Use **↑** or **↓** to choose the *Mo-Su* menu item and press **Setup**.
- Press **Next** to select a weekday.
- Press **1/2/-** to program the dosing procedures for the selected weekday. The following settings can be made:

Setting	Explanation
1	Dosing procedure 1 will be carried out on the selected weekday.
2	Dosing procedure 2 will be carried out on the selected weekday.
3	Dosing procedures 1 and 2 will be carried out on the selected weekday.
	No dosing procedure will be carried out on the selected weekday.

Table 40: Dosing procedures



INFORMATION

Please note that, if setting 3 is chosen, dosing procedure 1 and dosing procedure 2 must be programmed with a sufficient time gap between them. If one dosing procedure has not finished before the start time of the other one, the first will be interrupted and the other dosing procedure started.

- Press **OK**.
↳ The dosing pump displays the current configuration of this operating mode's parameters.

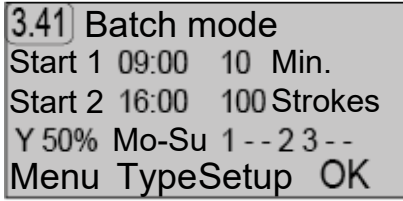


Fig. 37: Configuring the batch mode type Timer

In this example, the dosing procedure 1 starts on Monday and on Friday at 9 o'clock in the morning. Dosing procedure 1 runs for 10 minutes at 50% of the stroke frequency (Y 50%). Dosing procedure 2 starts on Thursday and on Friday at 4 o'clock in the afternoon. Dosing procedure 2 runs for 100 strokes at 50% stroke frequency.

- Press **OK**.

↳ The dosing pump displays the start screen of *Batch mode*.

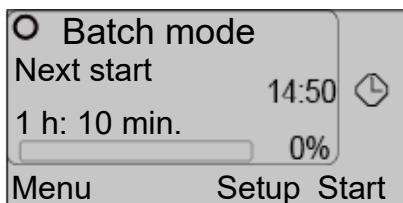


Fig. 38: Start-up display of the batch mode type Timer

↳ The start-up display of the batch mode type *Timer* shows the remaining time until the next start as well as the current time.

☞ Dosing procedures programmed.

11.2.4.5 Starting the dosing pump

If batch mode type *Start/Stop* is set:

1. Press **Start**.
2. Press **Start** again.
 - ↳ The dosing pump starts dosing immediately. The system automatically calculates the resulting delivery capacity and displays it.

☞ Dosing pump has started.

If batch mode type *Ext. Start* is set:

1. Press **Start**.
2. Supply a pulse to the pulse input of the dosing pump.
 - ↳ The dosing pump starts dosing immediately. The system automatically calculates the resulting delivery capacity and displays it.

☞ Dosing pump has started.

If batch mode type *Interval* is set:

- Press **Start**.
 - ↳ The dosing pump displays the time remaining until the set interval is reached. After the time has expired, the pump starts dosing.

☞ Dosing pump has started.

If batch mode type *Timer* is set:

- Press **Start**.

↳ The dosing pump starts dosing when one of the set days of the week and one of the set start times are reached.

☞ Dosing pump has started.

11.2.4.6 Stopping the dosing pump

- Press **Stop**.

☞ Dosing pump has stopped.

11.2.5 Network mode

Selecting the operating mode

1. Press **Menu**.
2. Use **↑** or **↓** to choose the *Operating mode* menu item and press **OK**.
3. Use **↑** or **↓** to choose the *Network mode* menu item and press **OK**.

☞ The dosing pump displays the start screen of *Network mode*.

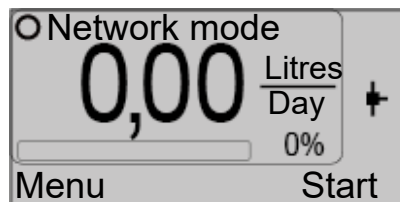


Fig. 39: Start screen of Network mode

In *Network mode*, the stroke frequency and number of strokes of the dosing pump are controlled by the signal applied to the network connection (Ethernet). In addition, all fault messages and status messages can be transmitted in the opposite direction.

You do not need to make any further configurations in the operating mode.

You must, however, enter or check the IP address. The dosing pump has a globally unique MAC number for unambiguous identification (for example: 00-C0-3D-00-27-8B). To uniquely identify the dosing pump on a TCP/IP network, it must be given an IP number (for example: "169.254.55.114"). The local network administrator assigns the IP number. There is no DHCP function to automatically assign numbers.

If you operate several dosing pumps on one network, their IP addresses must be matched with each other to differentiate them and to make possible unique addressing.

TCP/IP packets must conform with the Modbus TCP/IP protocol; this means that they can be sent from and received by the TOPAX DX Net multi-channel controller, by an Ethernet-capable PLC or a PC control console.

You can only operate the dosing pump in a local TCP/IP network (not via a gateway). The dosing pump monitors the network connection. If packets fail, the dosing pump automatically stops delivery. This means that the PLC or the PC control console must continuously trigger the dosing pump in an interval of less than one second.

A Web server is integrated in the dosing pump. To check the network connection, you can surf to the Web server from a PC with a Web browser and read out the current delivery capacity. Addressing is by means of the IP address.

11.3 External On/Off via Release input

Regardless of the selected operating mode, you can start or stop the dosing pump by means of the closed switching contact on the Release input.

If you set the function, the system displays in the selected operating mode the symbol for configuration of the release input.

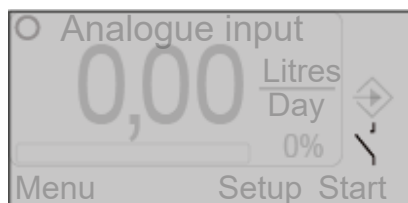


Fig. 40: Start screen of Analogue input with symbol for open contact

Starting the dosing pump

- ✓ If *Run = contact* is set:
 - ▶ Close the switching contact on the Release input.
- ☞ Dosing pump has started.
- ✓ If *Run = open* is set:
 - ▶ Open the switching contact on the Release input.
- ☞ Dosing pump has started.

Stopping the dosing pump

- ✓ If *Run = contact* is set:
 - ▶ Open the switching contact on the Release input.
- ☞ Dosing pump has stopped.
- ✓ If *Run = open* is set:
 - ▶ Close the switching contact on the Release input.
- ☞ Dosing pump has stopped.



INFORMATION

No alarm follows the external switch-off of the dosing pump.

12 Maintenance

Products from Lutz-Jesco GmbH are manufactured to the highest quality standards and have a long service life. However, some parts are subject to operational wear.

This means that regular inspections are necessary to ensure a long operating life of the product. Regular maintenance protects the product against operational disruptions.



DANGER

Mortal danger from electric shock!

Live parts can inflict fatal injuries.

- ▶ Before carrying out any maintenance work, always disconnect the device from the power supply.
- ▶ Secure the system to prevent it from being switched on by accident.
- ▶ The protective conductor (earth) may only be removed during the last step.
- ▶ After maintenance work, all earthing measures must be re-stored.

12.1 Maintenance intervals

To avoid malfunctions, you need to carry out regular maintenance on the dosing pump. This table gives you an overview of maintenance work and the intervals at which you must carry it out. Instructions on this maintenance work are provided in the sub-sections.

Interval	Maintenance
Regularly	• Check the oil level in the oil level glass. • Check that piping is seated firmly • Clean suction and pressure valves • Check that electrical connections are not damaged • Tighten up dosing head bolts • Check the dosing pump for unusual noises during operation, unusual temperatures or smells • Check servo motor
After a year or the first 5,000 operating hours	• Oil change
After two years or the first 10,000 operating hours	• Oil change

Table 41: Maintenance intervals

12.2 Changing the oil

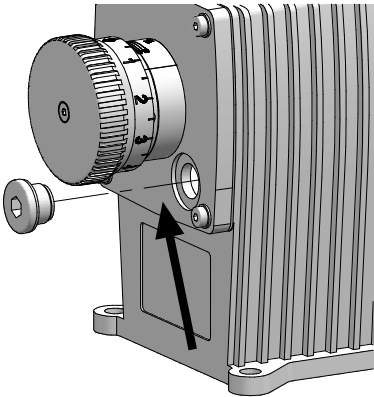


Fig. 41: Draining oil on the dosing pump

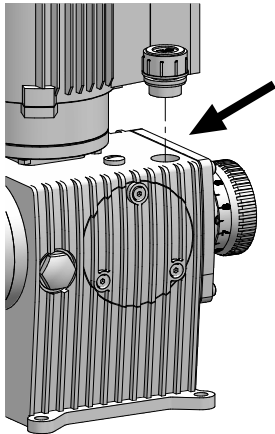


Fig. 42: Dosing pump oil inlet

Model	Filling volume
FEDOS LP	0.25 l

Table 42: Fill levels

- ✓ A suitable oil collecting tank is held ready.
 - ✓ Required equipment ⚙ is to hand: Gear oil of the viscosity class ISO VG 460 / SAE 140.
1. Unscrew and remove the closing bolt from the oil drain.
 2. Completely drain the gear oil from the housing into oil collection container.
 3. Place the washer seal on the oil drain and screw the closing bolt tight.
 4. Unscrew the closing screw a from the oil inlet and remove the washer seal.
 5. Pour the oil into the oil inlet (→ Table 42: Fill levels [▶ 46]). Check the oil level in the oil level glass at the same time. The oil level should reach to the middle of the oil level glass.
- 🔧 Oil changed.

12.3 Changing the piston



WARNING

Danger of crushing!

Piston movements can cause crushing injuries to hands.

- ▶ Do not reach into the area of the piston.
- ▶ Only ever perform work in the area of the piston when the dosing pump has been switched off.



NOTE

Possibility of damage to the device!

The use of the incorrect packing material can cause damage to the device due to leakage.

- ▶ Match the packing material to be used to the application purpose in terms of system pressure.
- ▶ Match the packing material to the chemical in terms of resistance.

✓ Required equipment ✂ is to hand: Open-end spanner AF 10

1. Switch off the dosing pump.
2. Loosen the clamping screws on the clamping flange using an AF10 open-end spanner.
3. Loosen the gland connection (7) with an appropriate tool. The screw connection can be loosened easily using two cotter pin drives d6 inserted into two opposite drillholes in the gland connection.

4. Pull the dosing head (1) from the holder in the axial direction.
NOTE! Slight rotary movements of the dosing head make dismantling easier.

5. Unscrew and remove the piston (8) from the piston rod using two open-end spanners. Use one open-end spanner to fix the piston rod and the other to unscrew the piston from the piston rod.

6. Grease the thread of the new piston with Molykote DX.

7. Now screw the new piston (8) into the piston rod.

8. To change the packing, unscrew the gland connection completely from the dosing head.

9. Pull out the defective packing using a packing extractor. Alternatively you can use a hook to remove the old packing.

10. Clean the packing area.

11. Install the new packing rings with staggered gaps. In doing so, observe the correct sequence of support ring, supporting disc, packing rings and another supporting disc.

12. Screw the gland back on hand tight.

13. Push the dosing head (1) into alignment with the piston (8) and the holding flange.

14. Secure the dosing head in the end position with clamping screws. **NOTE! Make sure that the valves are aligned vertically.**

15. Tighten the gland connection (7) carefully.

✂ Piston replaced.

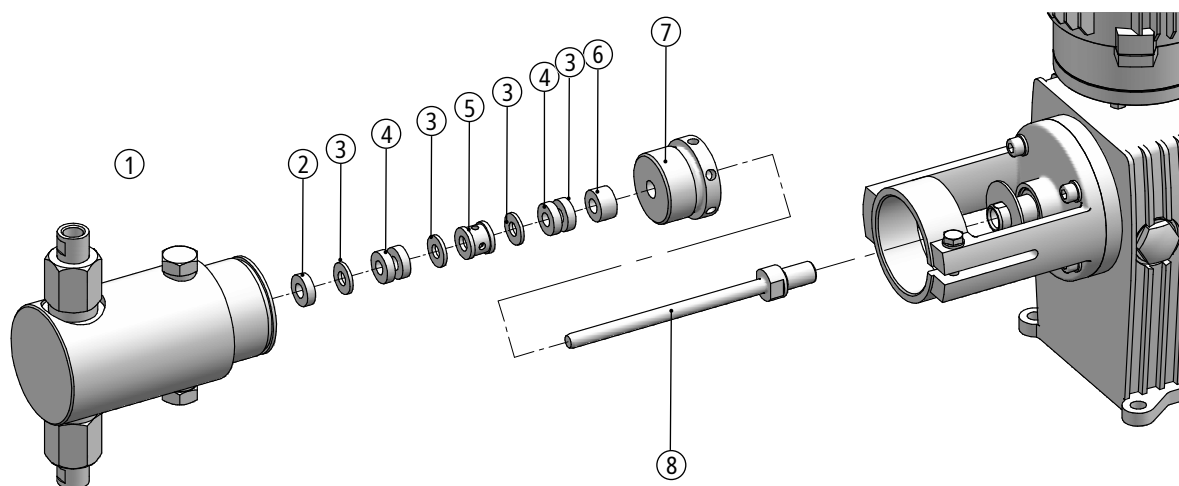


Fig. 43: Replacing the piston

1 Dosing head with pressure and suction valve	2 Support ring
3 Supporting disc	4 Packing ring
5 Piston flushing skirt	6 Pressure ring
7 Gland connection	8 Piston

12.4 Cleaning of suction and pressure valves

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

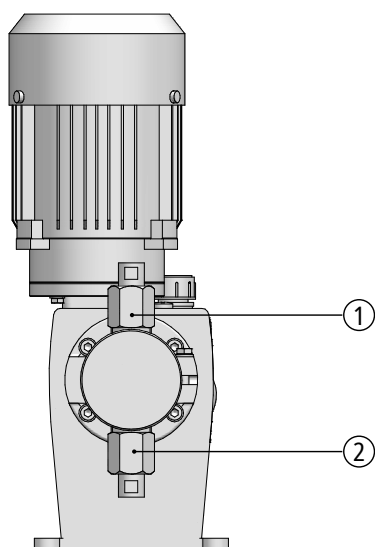


Fig. 44: Suction and pressure valve



INFORMATION

Suction (2) and pressure valves (1) 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. Ensure that the seals or O-rings are correctly seated inside the valves and the dosing head.



WARNING

Danger from old seals!

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.

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 device for repair.

13.1 Dosing pump not delivering or output too low

Possible cause	Measures for resolution
Valve leaking or blocked	• Clean the valve and vent the dosing pump. • Tighten the screw connections.
Valve installed incorrectly	Reassemble the valve. Ensure that the valve balls are located above the valve seats.
Valve damaged (e.g. valve balls).	Remove the damaged parts or install a new valve.
Suction line is leaking	Seal the leak locations or replace the parts.
Suction line is blocked (e.g. screen in foot valve).	Clean the suction line.
Shut-off valves closed	Open the shut-off valves. Inspect the dosing pump for possible damage.
Suction lift too high.	• Set the dosing pump to feed or reduce the suction head. • Install the pulsation dampener on the suction side. • Install a priming aid.
Viscosity too high	• Possibly reduce the concentration of the dosing medium or increase the temperature. • Install spring-loaded valves. • Increase the pipe diameter.
Power supply interrupted.	Restore the power supply.
The technical data of the drive motor does not match that of the power supply.	Check the electrical installation.
Back pressure too high (on pressure-side connection).	• Clean blocked injection nozzle. • Install pulsation damper to reduce pressure peaks resulting from over-long pipes. • Check function of safety valves.

Table 43: Dosing pump not delivering or output too low

13.2 Dosing pump does not prime

Possible cause	Measures for resolution
Valve leaking or blocked	• Clean the valve and vent the dosing pump. • Tighten the screw connections.
Valve installed incorrectly	Reassemble the valve. Ensure that the valve balls are located above the valve seats.
Valve damaged (e.g. valve balls).	Remove the damaged parts or install a new valve.
Suction line is leaking	Seal the leak locations or replace the parts.
Suction line is blocked (e.g. screen in foot valve).	Clean the suction line.
Shut-off valves closed	Open the shut-off valves. Inspect the dosing pump for possible damage.
Suction lift too high.	• Set the dosing pump to feed or reduce the suction head. • Install the pulsation dampener on the suction side. • Install a priming aid.
Viscosity too high	• Possibly reduce the concentration of the dosing medium or increase the temperature. • Install spring-loaded valves. • Increase the pipe diameter.
Power supply interrupted.	Restore the power supply.
Valves dry.	• Dampen the dosing head and the valves. • Vent the dosing head.

Possible cause	Measures for resolution
Air in the suction line with simultaneous pressure on the pressure valve.	Vent the dosing head or the lines.

Table 44: Dosing pump does not prime

13.3 Delivery rate varies

Possible cause	Measures for resolution
Valve leaking or blocked	- Clean the valve and vent the dosing pump. - Tighten the screw connections.
Valve damaged (e.g. valve balls).	Remove the damaged parts or install a new valve.
Suction line is leaking	Seal the leak locations or replace the parts.
Suction line is blocked (e.g. screen in foot valve).	Clean the suction line.
Viscosity too high	- Possibly reduce the concentration of the dosing medium or increase the temperature. - Install spring-loaded valves. - Increase the pipe diameter.
The technical data of the drive motor does not match that of the power supply.	Check the electrical installation.
Pressure on suction side too high.	Install a back-pressure valve in the pressure line.
Pressure peaks due to acceleration with long lines.	- Install a suction pressure regulator. - Install a pulsation damper.
Imprecise dosing due to changeable positive and negative suction heads.	Install a suction pressure regulator.
Back pressure too high (on pressure-side connection).	- Clean blocked injection nozzle. - Install pulsation damper to reduce pressure peaks resulting from over-long pipes. - Check function of safety valves.

Table 45: Delivery rate varies

13.4 No stroke movement observed

Possible cause	Measures for resolution
Diaphragm return spring broken.	Contact the manufacturer.
Power supply interrupted.	Restore the power supply.
The technical data of the drive motor does not match that of the power supply.	Check the electrical installation.

Table 46: No stroke movement observed

13.5 Dosing pump delivery rate too high

Possible cause	Measures for resolution
Pressure on suction side too high.	Install a back-pressure valve in the pressure line.
Pressure peaks due to acceleration with long lines.	- Install a suction pressure regulator. - Install a pulsation damper.

Table 47: Dosing pump delivery rate too high

13.6 Heavy leakage on the dosing pump

Possible cause	Measures for resolution
Packing not tightened strong enough.	Tighten gland stud carefully.
Piston has longitudinal grooves due to normal wear.	Replace piston and packing.

Possible cause	Measures for resolution
Excessive wear due to abrasive medium.	Replace PTFE packing with Aramid packing.

Table 48: Heavy leakage on the dosing pump

13.7 Loud noises on the dosing pump

Possible cause	Measures for resolution
Drive components worn.	Contact the manufacturer.

Table 49: Loud noises on the dosing pump

13.8 The drive is overloaded

Possible cause	Measures for resolution
Shut-off valves closed	Open the shut-off valves. Inspect the dosing pump for possible damage.
The technical data of the drive motor does not match that of the power supply.	Check the electrical installation.
Pressure peaks due to acceleration with long lines.	• Install a suction pressure regulator. • Install a pulsation damper.
Back pressure too high (on pressure-side connection).	• Clean blocked injection nozzle. • Install pulsation damper to reduce pressure peaks resulting from over-long pipes. • Check function of safety valves.

Table 50: The drive is overloaded

13.9 Motor hums and does not start.

Possible cause	Measures for resolution
The technical data of the drive motor does not match that of the power supply.	Check the electrical installation.
Back pressure too high (on pressure-side connection).	• Clean blocked injection nozzle. • Install pulsation damper to reduce pressure peaks resulting from over-long pipes. • Check function of safety valves.
No or insufficient oil in the gearbox	Fill up the gearbox oil.

Table 51: Motor hums and does not start.

14 Shutdown and disposal

14.1 Decommissioning the dosing pump

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. Depressurise 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.

 Dosing pump is decommissioned.

14.2 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 depressurised the hydraulic connections or locked to prevent dosing medium from escaping.
- You must follow the safety data sheet of the dosing medium.

14.3 Disposal of old equipment

Observe the following instructions when disposing of an old device:

- Clean the device thoroughly. In the case of hazardous dosing media, you must also neutralise and decontaminate it.
- Dispose of dosing medium residue properly.
- You must dispose of the device in accordance with local laws and regulations. It should not be disposed of as domestic waste!

As the disposal regulations may differ from country to country, please consult your supplier if necessary.

15 Spare parts



NOTE

Spare parts sets in a range of material combinations are listed in the current Lutz-Jesco GmbH price list.

16 Delivery characteristic curves

This section is intended to give you an idea of the delivery capacity that the dosing pump can achieve at specific backpressures. These delivery capacities were determined on the manufacturer's test stands. They apply at 20°C (68°F) for water, at 100% stroke frequency. The delivery capacity depends on the medium (density and

viscosity) and temperature. 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.

At 60 Hz operation, values are increased by a factor of 1.2.

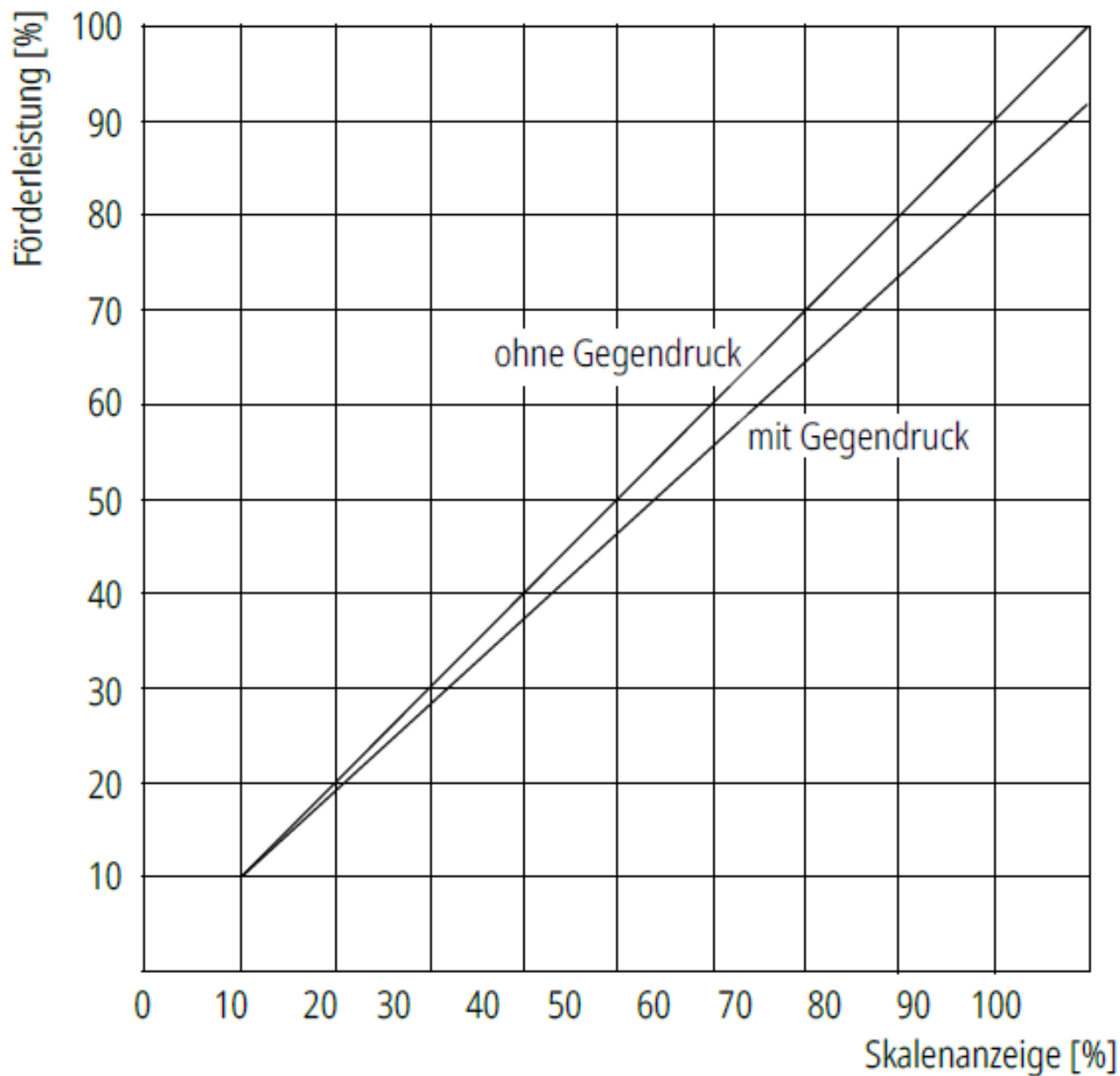


Fig. 45: Delivery characteristic curve FEDOS LP

17 EU declaration of conformity



(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.

(NL) EU-overeenstemmingsverklaring

Ondergetekende Lutz-Jesco GmbH, bevestigt, dat het volgende genoemde apparaat in de door ons in de handel gebrachte uitvoering voldoet aan de eis van, en in overeenstemming is met de EU-richtlijnen, de EU-veiligheidsstandaard en de voor het product specifieke standaard. Bij een niet met ons afgestemde verandering aan het apparaat verliest deze verklaring haar geldigheid.

(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-Kolbenndosierpumpe
Description of the unit:	Motor-driven piston Dosing Pump
Désignation du matériel:	Pompe doseuse à piston entraînée par moteur
Descripción de la mercancía:	dosificadora de piston accionada por motor
Omschrijving van het apparaat:	Gemotoriseerde zuigerdoseerpomp
Designação do aparelho:	Bomba doseadora de pistão motorizada

Typ / Type / Tipo:

FEDOS LP
FEDOS LP-NET

EU-Richtlinien / EU directives / Directives UE / Directiva de la UE:

Maschinenrichtlinie 2006/42/EG
EMV-Richtlinie 2014/30/EU
Niederspannungsrichtlinie 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 / harmonised standards / normes harmonisées: normas harmonizadas / normas armoniza

DIN EN ISO 12100:2011-03, DIN EN 809:2012-10,
DIN EN 61000-6-2:2005, DIN EN 61000-6-3:2007 + A1:2011

Es werden weiter folgenden Normen für „Drehende elektrische Maschinen“ nach EU Vorgabe eingehalten.

The following standards for "Rotating electrical machines" are also complied with in accordance with EU regulations.

EN 60034-1 VDE 0530-1:2011-02
EN 60204-1:2018
EN IEC 61800-3 VDE 0160-103:2019-04

Dokumentationsbevollmächtigter / Authorized person for documentation: Lutz-Jesco GmbH
Mandataire de documentation / el apoderado de documentación

Heinz Lutz, Geschäftsführer

Wedemark, 03.04.2023

Fig. 46: Declaration of conformity



Lutz-Jesco GmbH

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