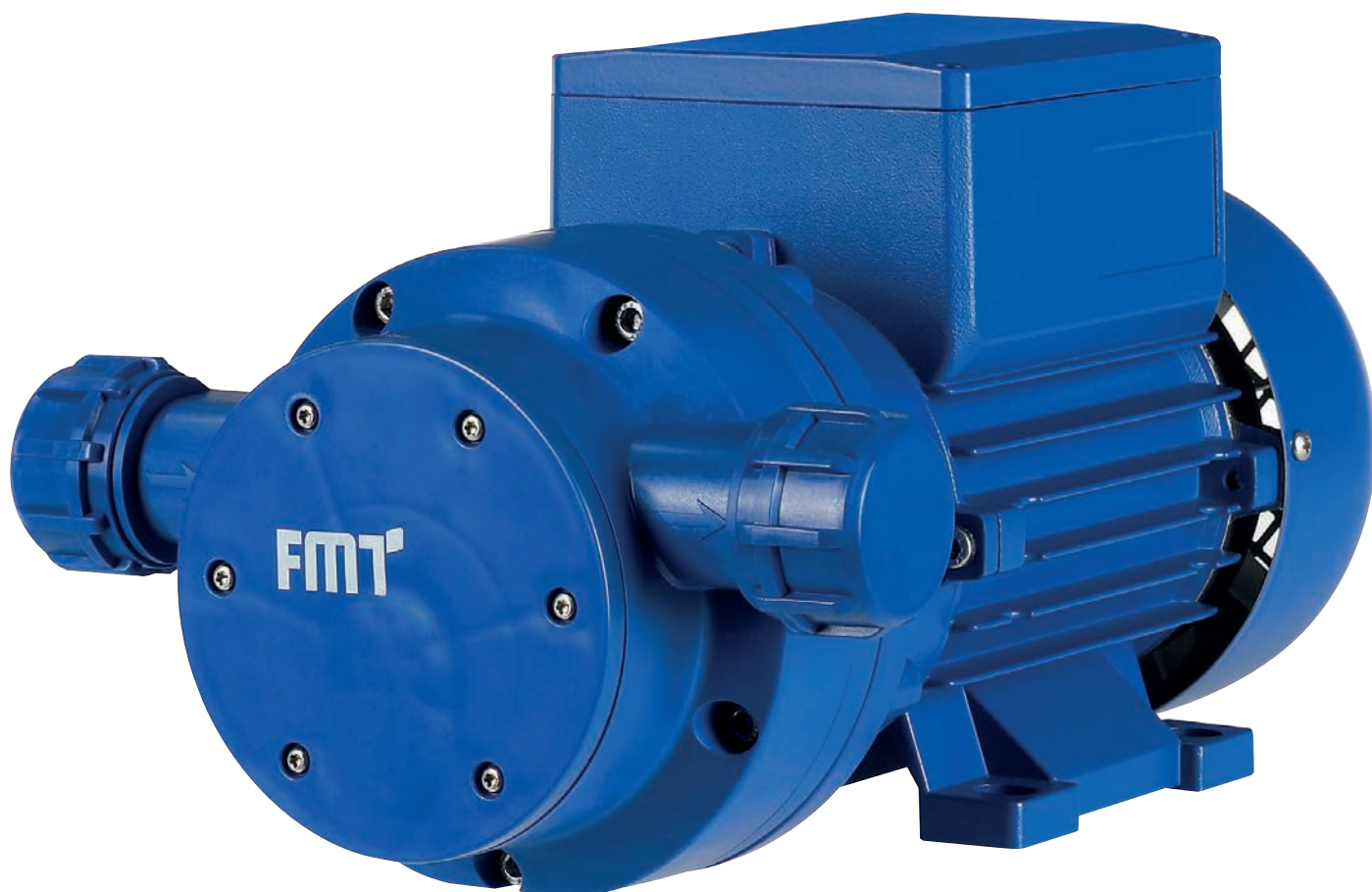


# OPERATING INSTRUCTIONS AND SAFETY NOTES

## Urea electric diaphragm pump

230 V 1~AC • 220 V 1~AC • 120 V 1~AC



**FMT Swiss AG**

This documentation is exclusively intended for the operating company and their staff.

Without our written consent, the content of this documentation (textes, figures, drawings, charts, diagrams etc. ), must not be duplicated or distributed, neither in full or in part, utilized for the purpose of competition or passed on/made available to third parties.

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Operating instructions translation

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We reserve the right to make design and product modifications, which serve to improve the product.

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## 1. Introduction

### 1.1 Preface

**Please carefully read these operating instructions and observe in particular all safety notes!**

Our staff will be pleased to provide support if you have any questions about the product.

**Yours sincerely, FMT Swiss AG**

### 1.2 Obligations of the personnel

Before they start to work, all persons who are entrusted with work with the urea electric diaphragm pump, are obliged:

- to follow all applicable regulations on occupational safety and accident prevention.
- to read and to comply with all safety instructions and warning notes contained in these operating instructions.

Please observe the following instructions in the interest of all concerned:

- Refrain from any unsafe working methods!
- Adhere to all hazard and warning notes contained in this manual!
- In addition to this documentation, keep to all generally accepted safety rules, legal provisions as well as all other binding rules regarding occupational safety, accident prevention and environmental protection!
- Wear appropriate protective clothing in accordance with the work to be done!
- Perform only work for which you have been sufficiently trained and instructed!
- Only genuine spare parts as well as original tools and auxiliaries of the manufacturer are allowed to be used in order to ensure the functional safety and maintain the warranty coverage.

### 1.3 Symbols in this manual

#### 1.3.1 Structure of the warning notes

The warning notes have the following structure:



#### **SIGNAL WORD**

##### **Type and source of the hazard**

- Consequences of non-compliance with the notes
- Measures to avoid that risk

Depending on the danger level, different signal words are used:

<b>Signal word</b>	<b>Danger level</b>	<b>Consequences of non-compliance</b>
<b>DANGER</b>	Imminent threat of danger	Death or serious bodily injury
<b>WARNING</b>	Possible threat of danger	Death or serious bodily injury
<b>CAUTION</b>	Possibly dangerous situation	Minor bodily injury
<b>ATTENTION</b>	Possibly dangerous situation	Damage to material property



## NOTE

Indicates further information or tips which facilitate work.

### 1.3.2 Hazard symbols

Symbol	Meaning
	General hazard symbol. The warning note marked in this way contains supplementary information on the type of hazard.
	This symbol warns of dangerous electrical voltages.
	This symbol warns of a hazardous explosive atmosphere.

### 1.3.3 General symbols

Symbol	Meaning
■	A small black square indicates the work you have to perform.
–	The dash denotes lists.
⇒	The arrow identifies cross-references.  If cross-references to other chapters are required within the text, the expression is shortened for reasons of clarity.  Example: ⇒ Chapter 2 Safety instructions This means: please refer to chapter 2 for the safety instructions

## 2. Safety instructions

Various dangers may occur if the urea electric diaphragm pump is improperly handled during installation, commissioning and daily operation.



## WARNING

**Risk of injury and damage to material property because of improper handling!**

- Hold the manual at the disposal of the operating staff at the usage site of the unit.
- Country-specific safety measures and accident prevention regulations must be observed.

## 2.1 Authorized personnel

Only qualified and authorized persons are allowed to operate and to work on the urea electric diaphragm pump.

Persons are qualified if they are, due to their training, experience, instruction and knowledge of the relevant standards, able to assess assigned tasks and to identify potentially hazardous situations.

These persons must have been authorized by the person responsible for the safety of the unit and must be able to identify and to avoid potential dangers.

All persons charged with installation, operation, maintenance and repair work, must have read and understood this operation manual.

A copy of this operating manual must be stored permanently and ready at hand at the place of usage of the unit.

## 2.2 Notes on maintenance/cleaning and repair



### WARNING

#### Risk of injury and damage to material property because of improper maintenance and repair

- Keep to the specified inspection and maintenance intervals (⇒ **Chapter Maintenance**).
- Should unusual noises occur, immediately stop the electric diaphragm pump. Immediately identify and eliminate the cause in order to avoid consequential damages.
- Observe the safety sheet for AdBlue®.

## 2.3 Intended conditions of use

The urea electric diaphragm pump is to be used only for the delivery of urea (AdBlue®) and water.

The temperature of the conveying liquid must be between -5 °C and + 35 °C.

The urea electric diaphragm pump is only allowed to be connected to a suitable power source (see nameplate).

To ensure that usage stipulations are met, read through the Operating Instructions completely before using the pump and observe all stipulations.

Any departure from the usage stipulations (other fluid media, use of force) or user modifications (changes, use of non-original parts) can be dangerous and are considered as non-intended usage.

The user is liable for any damage resulting from non-intended use.

During repairs to any electrical components, the appropriate safety and test requirements are to be observed.

Only genuine replacement parts are to be used for any repairs, because otherwise the warranty will be invalidated.

In order to prevent dirt from entering the pump chamber, it is absolutely necessary to install a strainer with pre-cleaner in the suction line, because otherwise the warranty may be invalidated.

Any application beyond the intended use can lead to hazardous situations and shall be regarded as non-intended use.



## DANGER

**Risk of injury and material damage from explosive vapors!**

- **Never use the pump to deliver explosive fluids such as petrol or other fluids with similar flashpoints!**
- Since the motor and the switch are not explosion-protected, the pump must **not** be operated in an explosion risk area.

## 2.4 Risks when handling the urea electric diaphragm pump



## DANGER

**Risk of injury and material damage because of improper installation, electric current or contaminated media**

**Never work on a pump that is running!**

- Mount or remove attachments and accessories only when the pump is switched off.
- For your own safety, disconnect the pump in addition from the power supply.

**Do not pump contaminated fluids**

- Take special care to ensure that there are no contaminants in the fluid to be pumped.
- Install a strainer on the suction pipe.

**Damaged attachments and accessories can lead to personal injury and material damage**

- Attachments and accessories must be checked for wear, splits or other damage throughout their period of use.
- Damaged accessories and attachments must be replaced immediately.
- With reference to the period of use, please note the details in ZH 1/A45.4.2 or DIN 20066 Part 5.3.2.

**Escaping liquids can cause environmental harm.**

Comply with the stipulations of the German Water Resources Act (WHG) and of the Plant Regulations of the German federal states.

## 2.5 Risks in handling AdBlue® solutions

The AdBlue® concentrate is not inflammable, not explosive and not oxidizing.



## NOTE

For cleaning, flush equipment with water. Dispose of released contaminated fluid according to the statutory provisions. In general, dilution with water is sufficient.

**AdBlue® is corrosive to non-ferrous metals.**

**Avoid skin and eye contact. In case of contact with the eyes, rinse the eyes with plenty of drinking water and consult a physician.**

Observe the safety sheet for AdBlue®.

## 3. Transport and temporary storage

Do not use the cable to transport the pump!

### Storage and transport conditions:

- Weather-protected storage with temperature control, protection against frost, moisture and rain. Maximum relative humidity: 80 %.
- Storage temperature range from -5 °C to + 55 °C.

## 4. Construction and functional description

The self-priming pump is compact and handy. A wide range of FMT accessories are available for quick and easy mounting on each installation.

The materials of the pump are compatible with slightly aggressive liquids like AdBlue®.

The pump is electrically driven by an alternating current motor suitable for continuous operation. The pump is directly flange-mounted to the motor. In case of overload, a thermal protection device automatically switches off the motor.

When the motor has cooled down, the thermal protection device automatically restarts the motor.

Pump data ⇒ Chapter Technical Data.

The urea electric diaphragm pump is available in the following versions:

- **Urea electric diaphragm pump, 230 V, 50 Hz, 35 l/min**
- **Urea electric diaphragm pump, 220 V, 60 Hz, 35 l/min**
- **Urea electric diaphragm pump, 120 V, 60 Hz, 35 l/min**

### 4.1 Area of application

The urea electric diaphragm pump is only suitable for the delivery of urea (AdBlue®) and water.

The temperature of the delivery fluids must be between -5 °C and +35 °C. The temperatures must not be above or below these limit values.

Since the motor and the switch are not explosion-protected, the pump must **not** be operated in an explosion risk area.

## 5. Technical data

Designation	230 V 25 280	220 V 25 280 005	120 V 25 280 006
Power cable length (m) / (ft)	2,8 / 9.2	2,8 / 9.2	2,8 / 9.2
Connection suction side	G 1" male		
Connection discharge side	G 1" male		
<b>Hydraulic data</b>			
Pump design	Diaphragm pump self-priming		
Delivery rate under free discharge (l/min) / (gpm)	35 / 9.25		
Suction height (m) / (ft)	3 / 9.85	3 / 9.85	2,5 / 8.2
Discharge pressure up to (bar) / (psi)	1,7 / 24.6	1,7 / 24.6	1,8 / 26.1
Pumping media	urea (AdBlue®), water		
<b>Motor data</b>			
Voltage (V)	230	220	120
Frequency (Hz)	50	60	60
Power consumption (A)	1,5	2,8	2,8
Power (kW)	0,36	0,33	0,32
Thermal protection	self resetting		
Rotation speed (rpm)	2800	3500	3450
Type of construction	IMB 3		
Protection class	IP 54		
Material diaphragm and sealings	EPDM/FKM		



Material pump housing	PP		
Dimensions L x W x H (mm) / (inch)	310 x 180 x 160 / 12.2 x 7.1 x 6.3		
Weight (kg) / (lbs)	6,86 / 15.12	6,86 / 15.12	6,91 / 15.23

Tab. 5-1: Technical data

## 6. Installation

The urea electric diaphragm pump is designed for installations in indoor and outdoor areas.

For outdoor installation, a housing is required as protection against the effects of weather.

4 screws with a diameter of less than 7 mm are required to fasten the urea electric diaphragm pump (not contained in the scope of delivery).

When installing the pump, ensure that it is mounted on a stable surface. Select a secure location (protected from splash water, damage and theft).

- Remove the plastic plugs from the suction and discharge junctions.
- Fix the hoses to the suction and delivery connectors. Attach the strainer to the end of the suction hose.
- Attach the nozzle valve to the delivery hose.
- Use the mains plug or clamps to connect the pump to a power source according to the specifications on the type plate: 230 V/50 Hz; 220 V/60 Hz; 120 V/60 Hz.
- Lay the power cable in a way that avoids any risk of stumbling.



### NOTE

Ensure cleanliness during installation and an exact connection of the accessories with the pump housing.

## 7. Commissioning and operation

Check the operativeness of the electric diaphragm pump before use and after a failure-related or scheduled downtime.

Check the urea electric diaphragm pump and the installed accessories for completeness and damage. Replace any damaged components immediately. Never use a pump if damaged.

Check the suction strainer for damage each time the tank is filled/emptied and replace it if damaged. Never operate the pump without the suction strainer because otherwise the urea electric diaphragm pump will not be protected against contamination by foreign bodies.

- Hang the suction hose into the container to be emptied.
- Hold the nozzle valve into the container to be filled.
- Operate the rocker switch to switch on the pump.



### CAUTION

- Never operate the pump without liquid. The urea electric diaphragm pump may be damaged by running dry.
- The bypass valve allows operation with closed delivery line only for a short period (for a maximum of 3 minutes).

Press the nozzle valve lever up according to the delivery rate required, or lock it in position for constant flow (only applicable to automatic nozzle valve, not included in standard delivery).



## CAUTION

- The urea electric diaphragm pump does not switch off automatically, therefore when filling, never let the pump running without supervision.

- For finishing the filling operation, release the nozzle valve control lever. Never operate the pump for longer than 3 min with closed nozzle valve.
- Operate the rocker switch to switch off the pump.
- Position the nozzle valve so that no media can pollute the environment.



## CAUTION

### Danger of product damage

- The power source must be of the correct voltage for the pump type.

## 8. Preventive maintenance

In general, the urea electric diaphragm pump is very easy to maintain and to service.

Due to the operator responsibilities according to § 19i WHG (German Water Resources Act) the following components must be regularly checked and replaced as necessary to minimise the risk of environmental or equipment damage or personal injury:

- Pump housing
- Delivery hose
- Nozzle valve

## 9. Maintenance

Maintenance must be done by qualified technical personnel. External impact may cause a loss of performance, constitute a risk of damage to persons and/or property and void the guarantee.

Observe the following recommendations for operating the pump:

- Before performing any maintenance work, disconnect the urea electric diaphragm pump from all electric and hydraulic supply sources.
- Always wear personal protective equipment when carrying out maintenance work.
- If there is danger of freezing, the pump and the circuit must be emptied and stored at a location with a temperature not lower than 0 °C/32 °F.
- Check to ensure that the labels and decals have not become illegible and have not come loose in the course of time.
- Check at regular intervals that the line connections have not worked loose in order to avoid that liquid escapes.
- Regularly check and clean the suction line filter.
- From time to time, check the pump housing and remove any dirt.
- Check to ensure that the power cables are in perfect working order.
- If the pump is planned to be put out of operation for more than 15 days, completely empty the pump and the system in order to prevent the urea from crystallizing inside the pump system. Finally, thoroughly clean the pump and the system.

## 10. Troubleshooting

Malfunction	Cause	Solution
Motor does not run	▶ No power supply	▶ Check the electric connections
Discharge rate too low	<ul style="list-style-type: none"> <li>▶ Discharge hose kinked or clogged</li> <li>▶ Suction line resistance too high</li> <li>▶ Filter resistance too high</li> <li>▶ Nozzle valve not completely open</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check the discharge hose</li> <li>▶ Suction line too long, kinked, clogged or too many bends</li> <li>▶ Check the suction filter and the check valve</li> <li>▶ Check and clean the suction filter</li> <li>▶ Completely open the nozzle valve</li> </ul>
Pump runs too loudly	<ul style="list-style-type: none"> <li>▶ Air entry in the suction line</li> <li>▶ Feed quantity too low</li> <li>▶ Suction tank without pressure compensation</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check the airtightness in the suction line</li> <li>▶ Tank almost empty or empty</li> <li>▶ Dirty suction filter</li> <li>▶ Sufficiently ventilate suction tank, for example by means of FMT vent valve (45 150)</li> </ul>
Leak	<ul style="list-style-type: none"> <li>▶ Defective diaphragm</li> <li>▶ Defective O-Ring</li> </ul>	<ul style="list-style-type: none"> <li>▶ Replace the diaphragm kit (80 864)</li> <li>▶ Replace the O-ring (82 869)</li> </ul>
Pump rotates with difficulty	<ul style="list-style-type: none"> <li>▶ Deposits or foreign materials in the pump</li> <li>▶ Pump is frozen (Temperature too low)</li> </ul>	<ul style="list-style-type: none"> <li>▶ Clean the pump</li> <li>▶ Let thaw the pump and check it for damage. Operating the pump at a too low temperature may lead to damages at the pump or at the motor</li> </ul>

Tab. 10-1: Troubleshooting

## 11. Repair/Service

The urea electric diaphragm pump was developed and produced according to the highest quality standards.

Should a problem develop, despite all quality controls, please contact our customer service:

### FMT Swiss AG

Tel +49 9462 17-216

Fax +49 9462 1063

service@fmtag.ch

## 12. Disposal

The operating company is responsible for the proper disposal of the pump.

Hereby, the industry-specific and local regulations must be observed when disposing of the pump.

Only qualified personnel is authorized to disassemble and dispose of urea electric diaphragm pump.

### 13. EC Declaration of Conformity



Manufacturer:

**FMT Swiss AG**

Fluid Management Technologies Swiss AG

Gewerbestraße 6

6330 Cham / Schweiz

Declares under his sole responsibility that the machine:

<b>Model type</b>	<b>Urea electric diaphragm pump</b> <b>25 280 (230 V)</b> <b>25 280 005 (220 V)</b> <b>25 280 006 (120 V)</b>
Motor voltage	230 / 220 / 120 V
Weight	5 / 7 kg
Power	25 280 (230 V) - 0,36 kW 25 280 005 (220 V) - 0,33 kW 25 280 006 (120 V) - 0,32 kW
Function	Conveying of urea ( AdBlue® ) and water
Complies with all relevant provisions of the following Directive:	
EC Directives	2006/42/EG Machinery Directive 2014/30/EU EMC Directive 2011/65/EU EU-Directive (RoHS)
Applicable standards	EN 809; EN ISO 4144; EN 60204-1 EN 12100:2010; EN 55011; EN 61000-2-4

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FMT Swiss AG  
Cham, 22.06.2016

Dipl.-Ing. Rudolf Schlenker  
(Managing Director)

14. Mounting dimensions of urea electric diaphragm pumps (in mm)

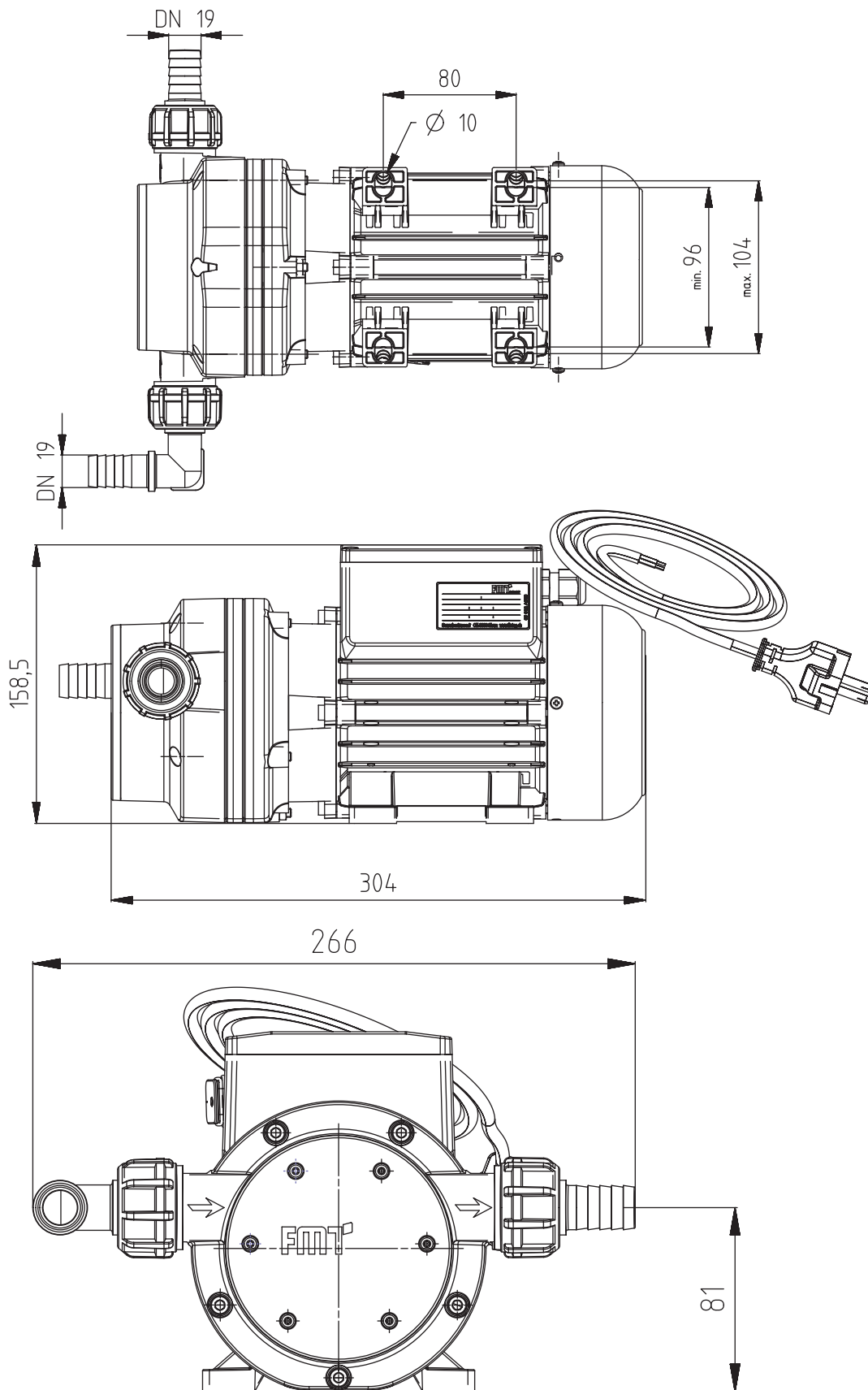


Fig. 14 -1: Mounting dimensions of urea electric diaphragm pumps (in mm)

### 15. Exploded view of urea electric diaphragm pump

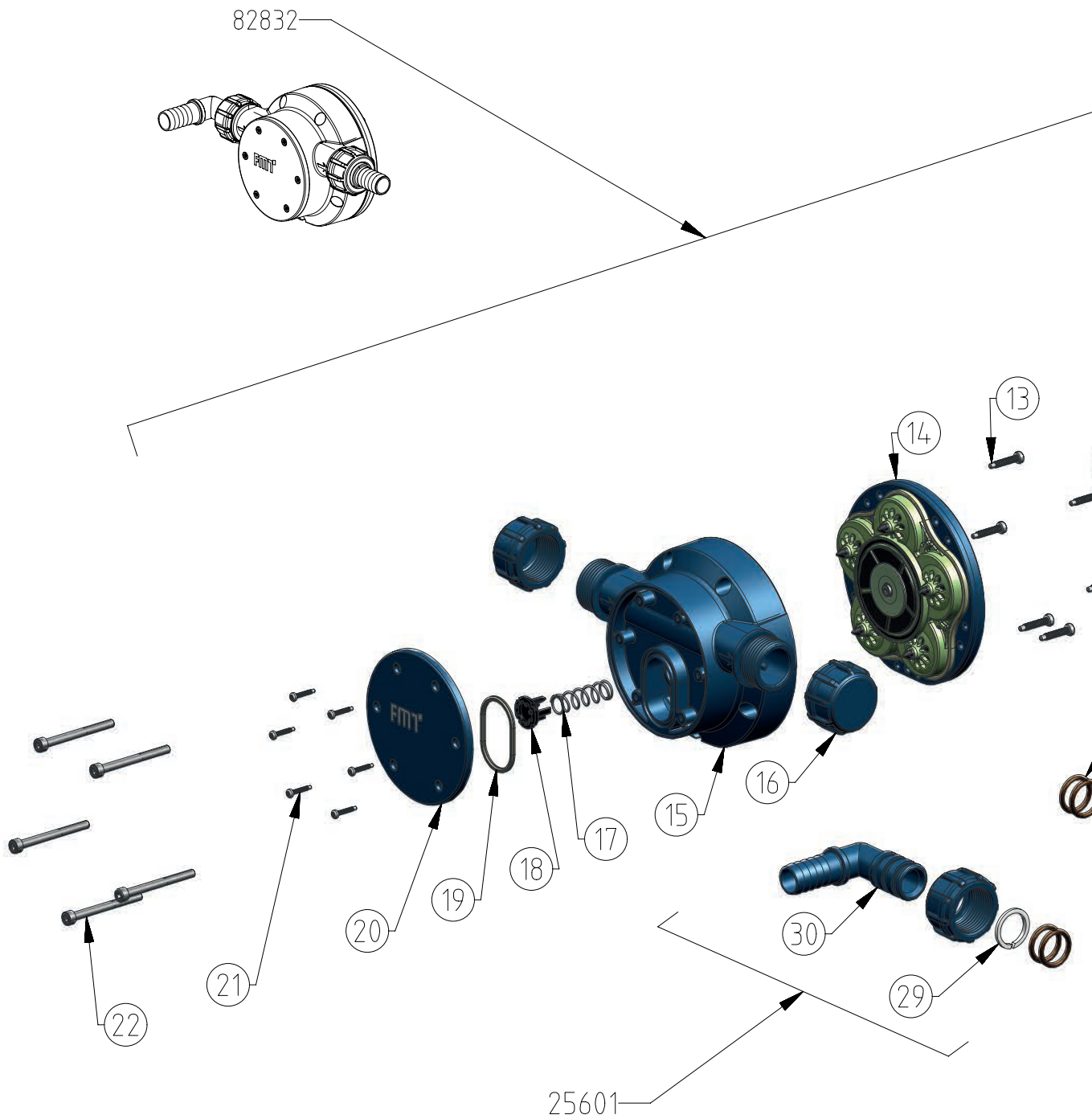
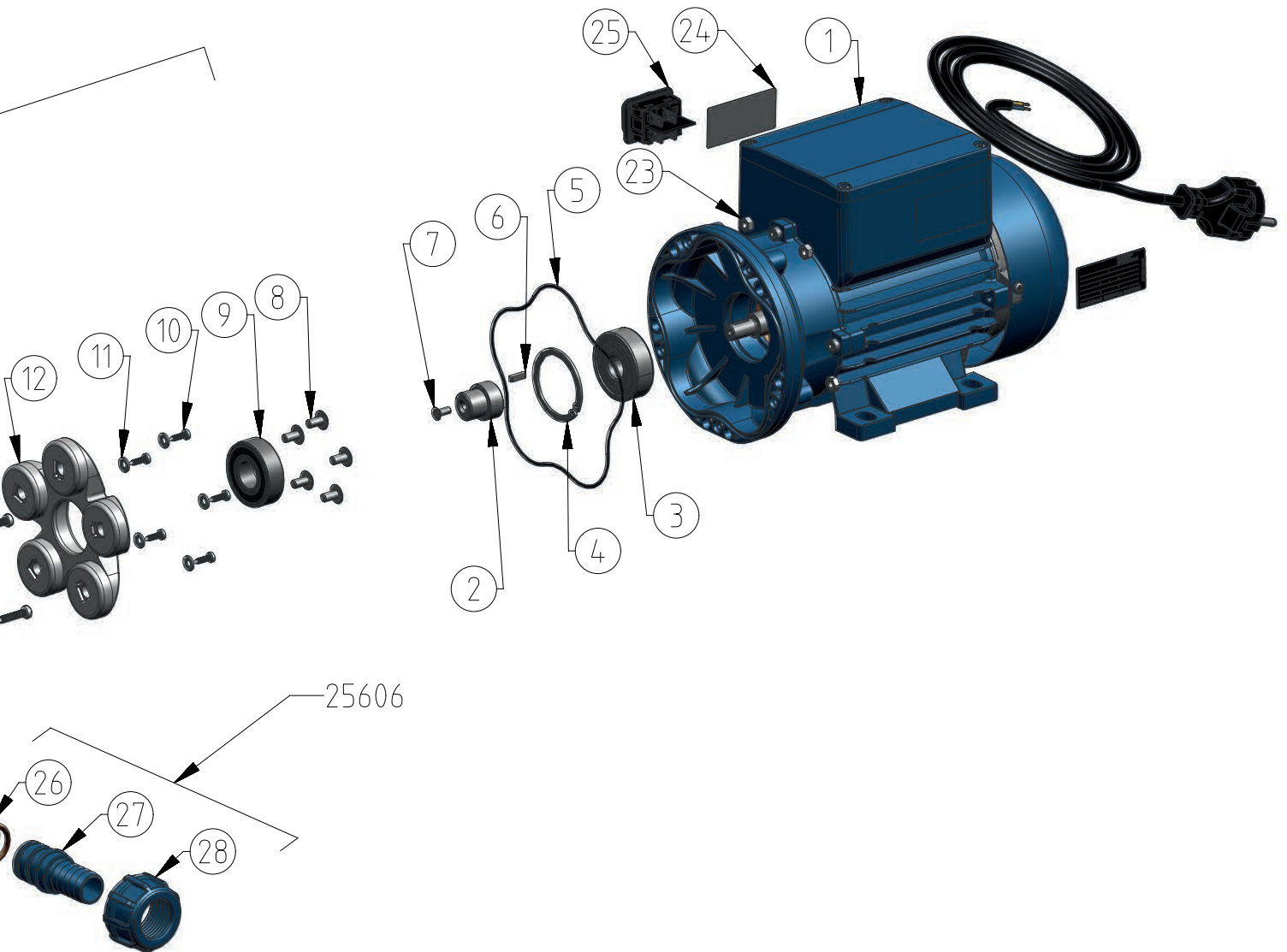


Fig. 15-1: Exploded view of urea electric diaphragm pump



## 16. Overview of components of urea electric diaphragm pump

Pos.	Quantity	Description	230 V	220 V	120 V
		Pump body ZSB assembly		82 832	
1	1	Motor painted blue 35 l/min	83 705	80 492	86 387
2	1	Eccentric flange for 50Hz		82 864	
3	1	Ball bearing-DIN625-1 6302-2Z		82 867	
4	1	Circlip DIN 472		82 934	
5	1	O-Ring-FKM 70-Ø120x2		82 869 878	
6	1	Feather key DIN 6885 A		00 602	
7	1	Countersunk screw M 4x10		84 012	
8	5	Screw M 5x10		80 730	
9	1	Ball bearing DIN625-1 6203 2Z		82 855	
10	5	Fillister head screw STSplus		82 845	
11	5	Tension plate DIN6796-Ø4		82 846	
12	1	Swash cross		82 844	
13	6	Plastic screw 4x22		86 768	
14	1	Spare parts for urea electric diaphragm pump		80 864	
15	1	Pump housing		82 833	
16	2	Screw cap G1 blue		82 857 001	
17	1	Bypass spring		82 836	
18	1	Bypass valve		82 837	
19	1	X-Ring EPDM 37,77x2,62		86 985	
20	1	Cover		82 834	
21	6	Plastic screw 3x16		86 769	
22	5	Cylinder screw M 5x55		86 893	
23	5	Hexagonal nut DIN 934		86 773	
24	2	Plate		89 882	
25	1	Waterproof switch		83 697	
26	4	O-Ring FKM 80 - 19,2x3		82 859 878	
27	1	Nipple		82 858	
28	2	Nut G1 blue		82 857	
29	1	Circlip		82 862	
30	1	Angle 90 straight		82 861	

Tab. 15-1: Overview of components for Fig. 15-1





## 17. Pump sets for assembly on IBC containers

### 17.1 Design

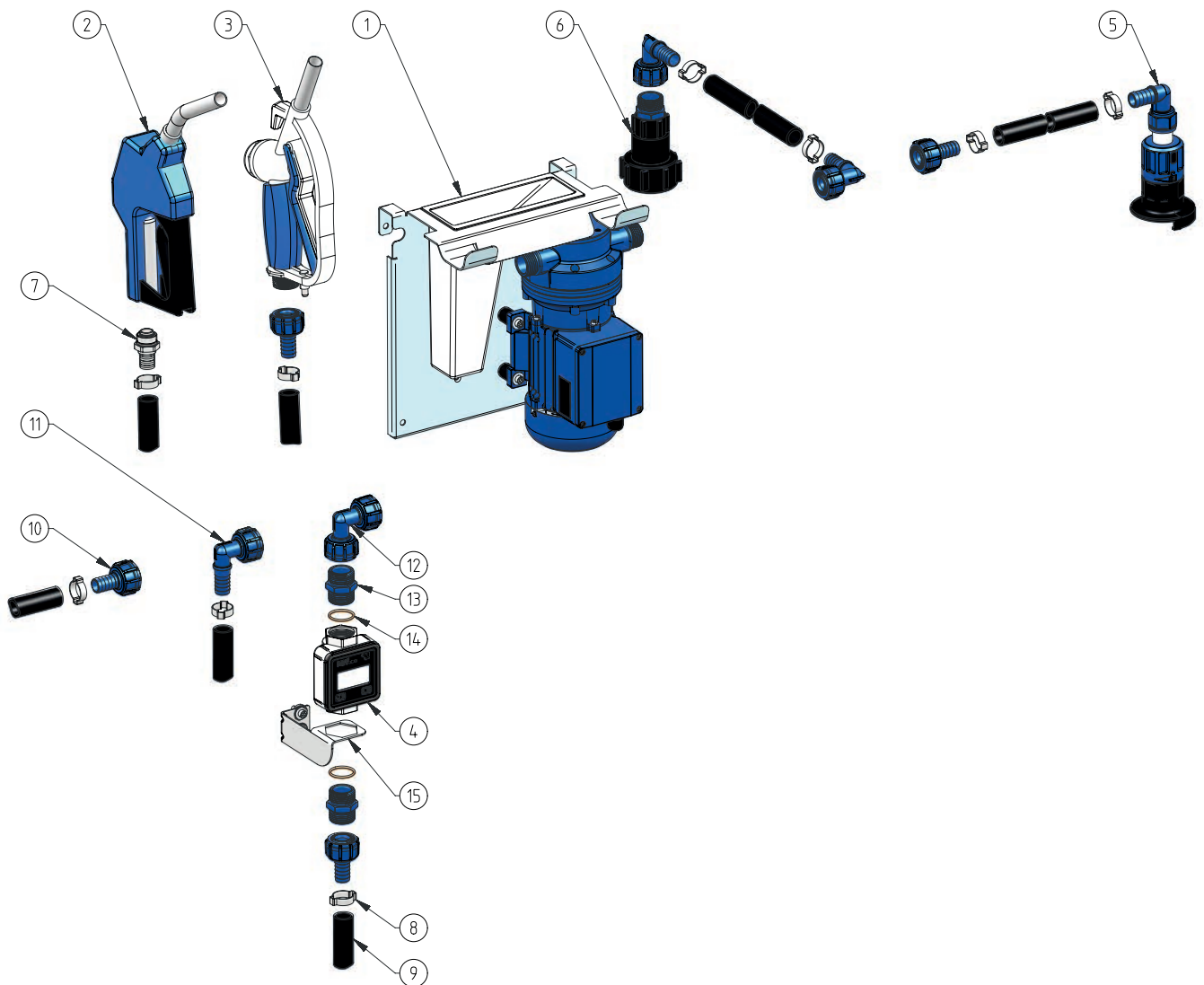


Fig. 17-1: Design

#### Pos. Description

1	Mounting bracket for IBC
2	Automatic nozzle valve-urea
3	Mechanical nozzle valve-urea
4	In-line meter, digital
5	SEC adaptor for IBC
6	IBC adaptor for urea tanks
7	Swivel joint DN 19-stainless steel
8	2 ear hose clamp

#### Pos. Description

9	Discharge hose
10	Hose fitting
11	Bend 90° with fitting
12	Bend 90° with 2 x union nut
13	Double nipple
14	O-ring FKM 80
15	Meter holder for IBC set urea

Tab. 17-1: Overview of the individual parts of fig. 17-1

## 17.2 Assembly on an IBC container

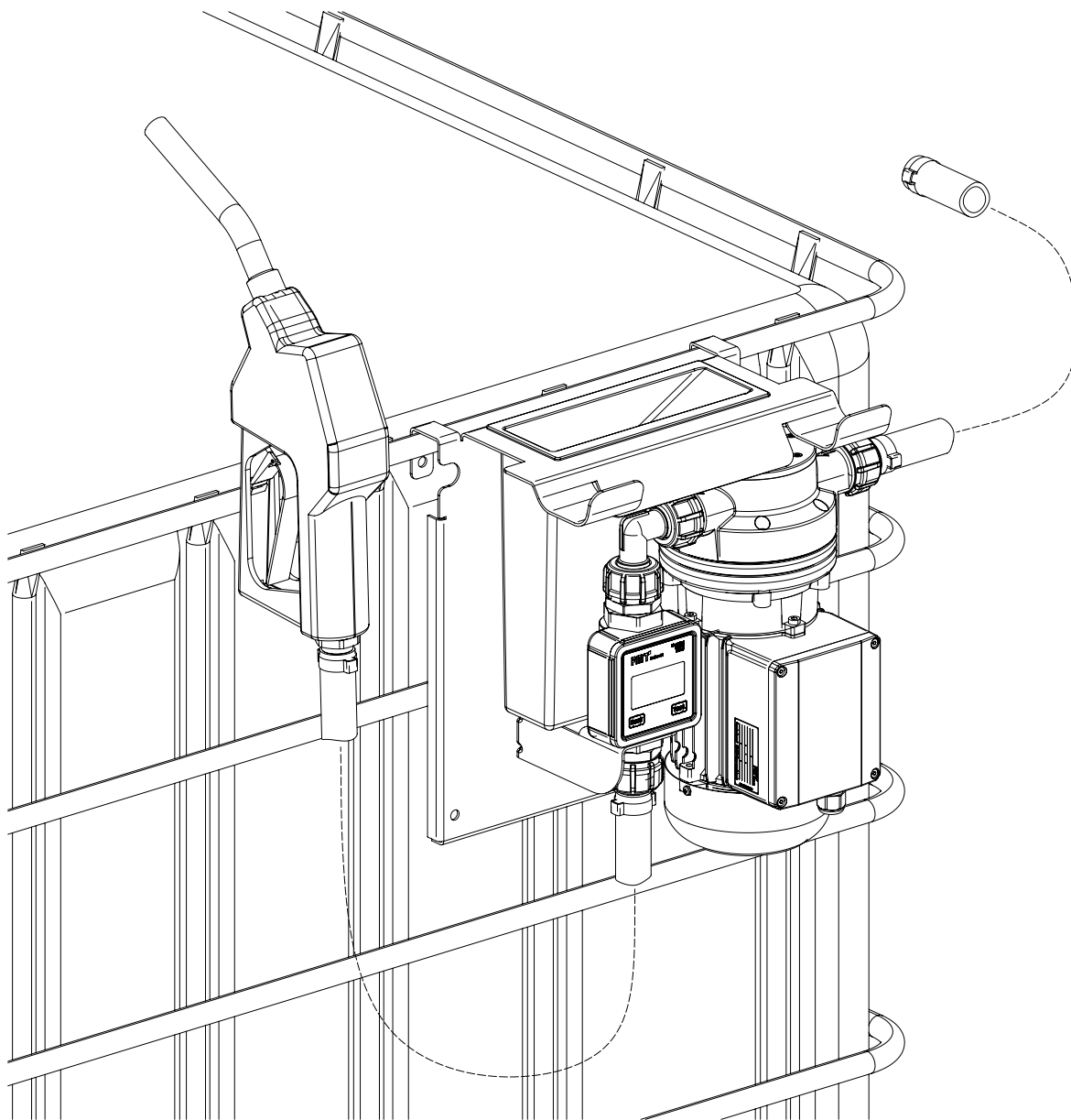


Fig. 17-2: Assembly on the IBC container



### CAUTION

- Ensure a stable and safe fastening of the discharge system during each installation.

## 18. Pumps sets with filter for assembly on IBC containers

### 18.1 Design

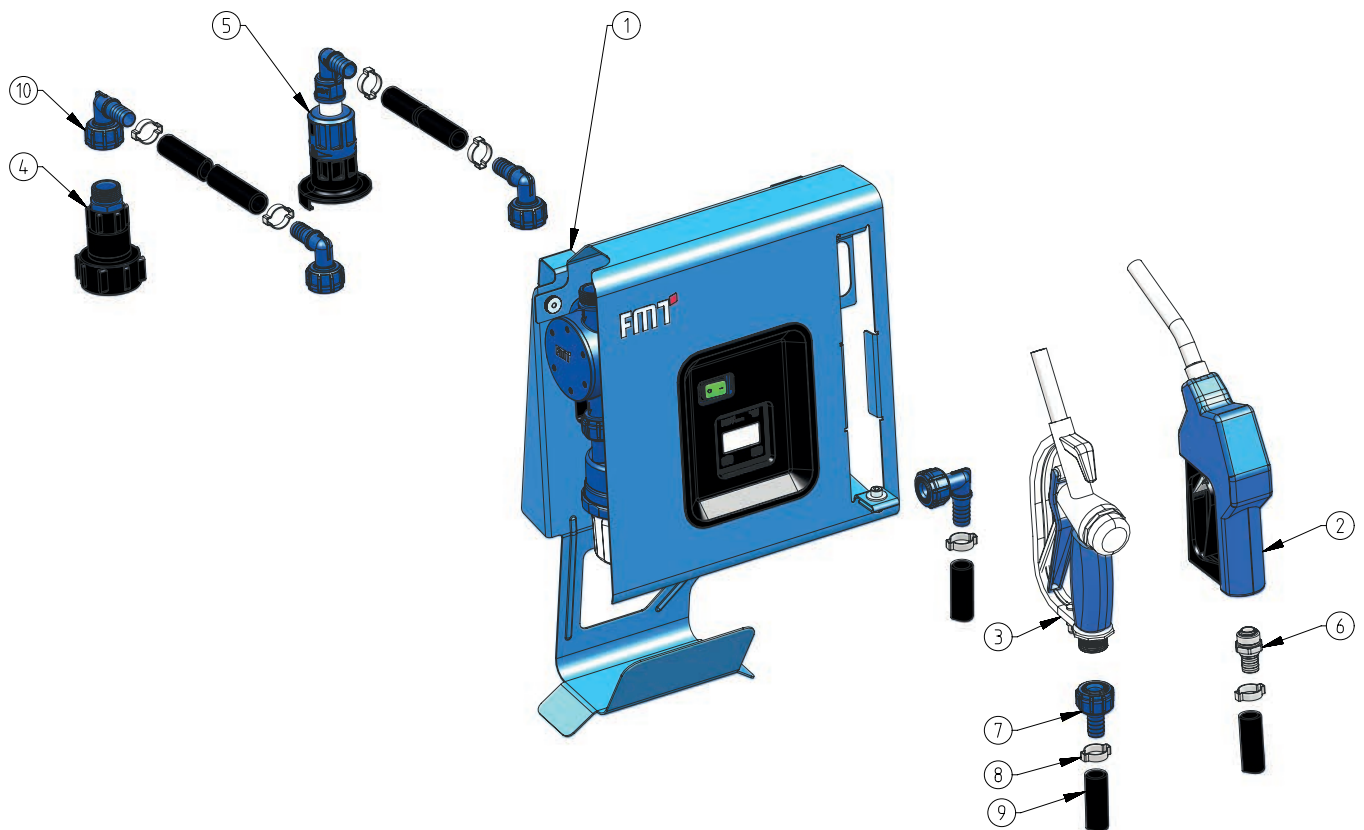


Fig. 18-1: Design

#### Pos. Description

1	Support plate with clinch stud
2	Automatic nozzle valve-urea
3	Mechanical nozzle valve-urea
4	Adapter M64 x 4
5	SEC adaptor for IBC

#### Pos. Description

6	Swivel joint DN 19 - stainless steel
7	Hose fitting DN 19
8	2 ear hose clamp
9	Discharge hose for urea
10	Bend 90° with fitting

Tab. 18-1: Overview of the individual parts of fig. 18-1

## 18.2 Assembly on an IBC container

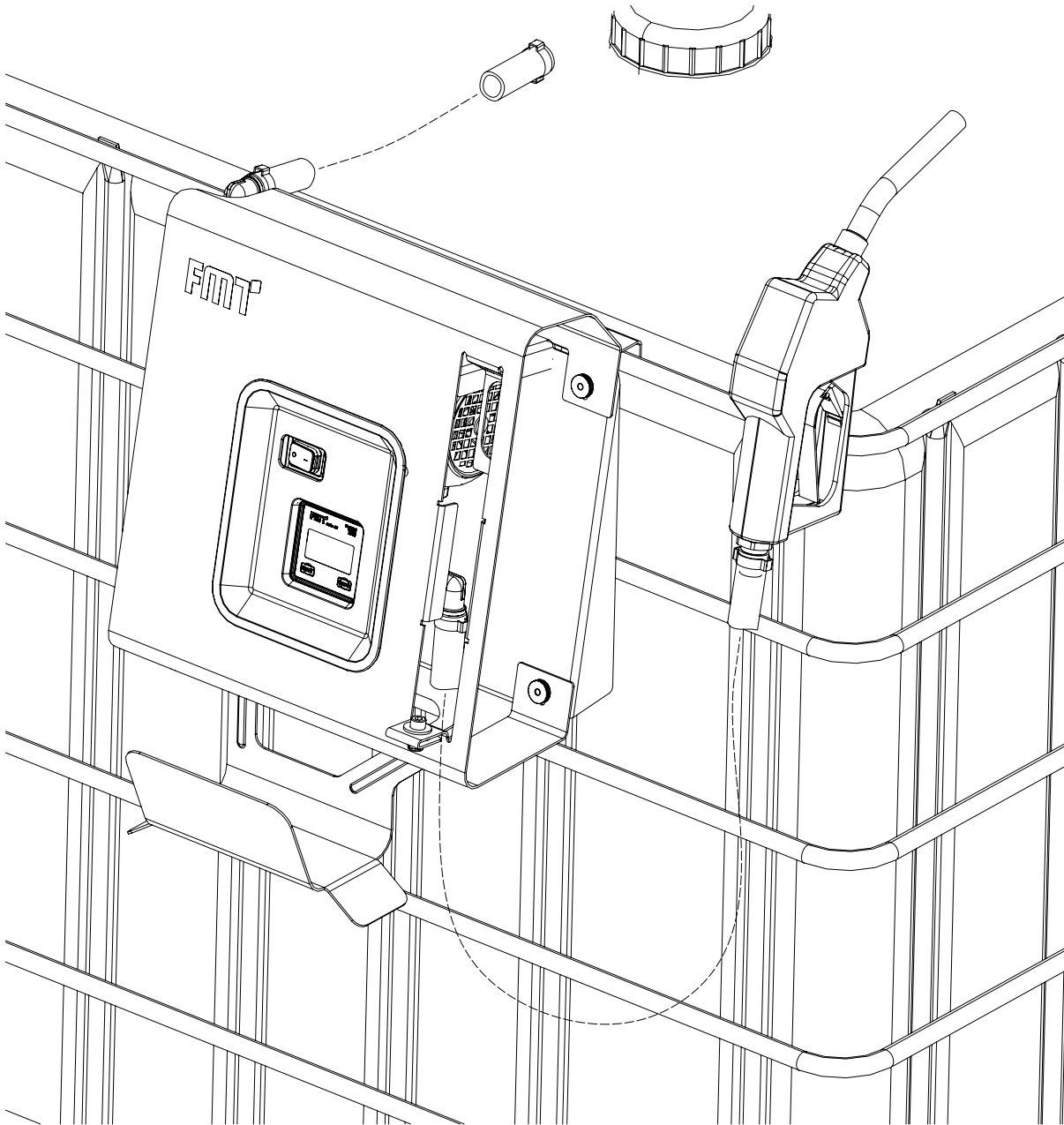


Fig. 18-2: Assembly on the IBC container



### CAUTION

- Ensure a stable and safe fastening of the discharge system during each installation.

## 19. Pump sets for assembly on a barrel

### 19.1 Design

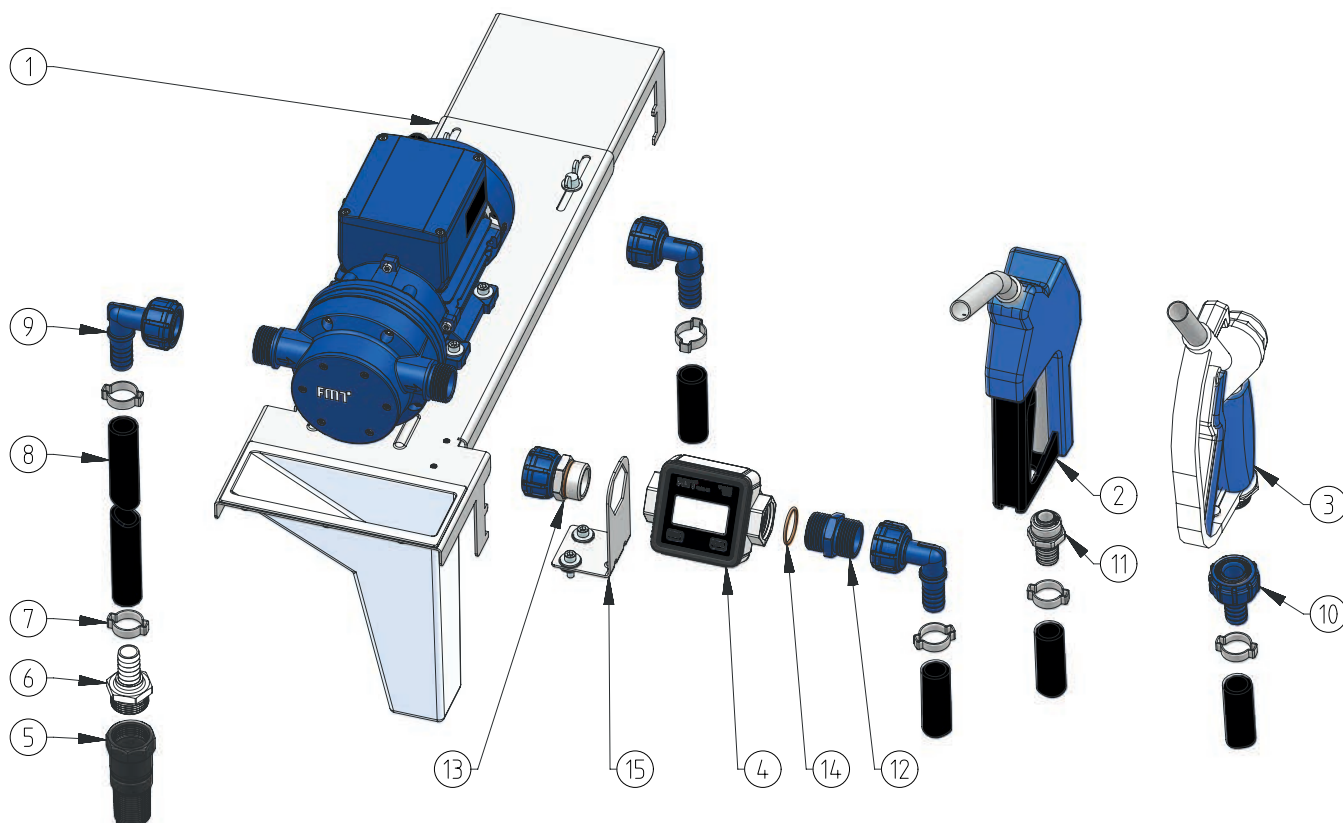


Fig. 19-1: Design

#### Pos. Description

- 1 Telescopic mounting bracket
- 2 Automatic nozzle valve-urea
- 3 Mechanical nozzle valve-urea
- 4 In-line meter, digital
- 5 Foot valve with filter
- 6 Threaded fitting DN 19
- 7 2 ear hose clamp
- 8 Suction hose for urea

#### Pos. Description

- 9 Bend 90° with fitting
- 10 Hose fitting DN 19
- 11 Swivel joint DN 19 - stainless steel
- 12 Double nipple
- 13 Connection fitting short
- 14 O-ring FKM 80
- 15 Meter holder for telescopic mounting bracket

Tab. 19-1: Overview of the individual parts of fig. 19-1

## 19.2 Assembly on a barrel

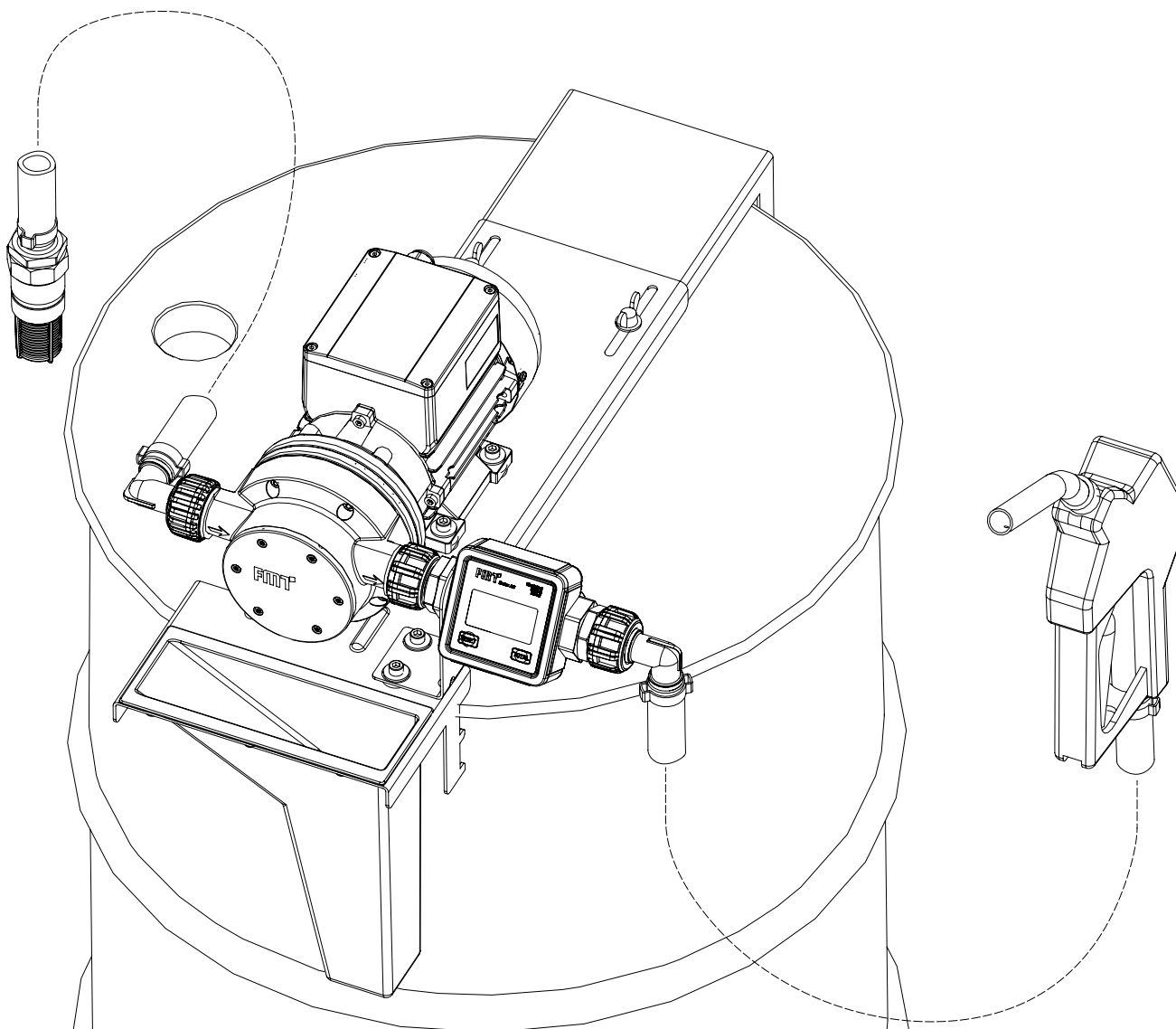


Fig. 19-2: Assembly on a barrel



### CAUTION

- Ensure a stable and safe fastening of the discharge system during each installation.

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