

# OPERATING INSTRUCTIONS AND SAFETY NOTES

## Urea electric diaphragm pump

12 V DC • 24 V DC



**Operating instructions - urea electric diaphragm pump****FMT Swiss AG**

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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.



## operating instructions - urea electric diaphragm pump

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# Operating instructions - urea electric diaphragm pump

## 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:

SIGNAL WORD	Danger level	Consequences of non-compliance
<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




## operating instructions - urea electric diaphragm pump



### 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.

## **Operating instructions - urea electric diaphragm pump**

### **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.

## operating instructions - urea electric diaphragm pump



### 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 eyes, rinse the eyes with plenty of drinking water and consult a physician.**

Observe the safety sheet for AdBlue®.

## Operating instructions - urea electric diaphragm pump

### 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 a direct current motor suitable for continuous operation. The pump is directly flange-mounted to the motor.

Pump data ⇒ Chapter Technical Data.

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

- **Urea electric diaphragm pump, 12 V, 30 l/min**
- **Urea electric diaphragm pump, 24 V, 30 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

	12 V 25 281	24 V 25 282
<b>Designation</b>		
Power cable length (m) / (ft)	3 / 9.84	
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)	30 / 7.9	
Suction height (m) / (ft)	3 / 9.84	
Discharge pressure up to (bar) / (psi)	1,7 / 24.6	
Pumping media	urea (AdBlue®), water	
<b>Motor data</b>		
Voltage (V)	12	24
Power consumption (A)	18	9
Power (kW)	0,22	
Fuse (A)	25	
Rotation speed (rpm)	2800	
Type of construction	IMB 5	
Protection class	IP 56	
Material diaphragm and sealings	EPDM/FKM	
Material pump housing	PA 6 GF 30	
Dimensions L x W x H (mm) / (inch)	315 x 185 x 130 / 12.4 x 7.28 x 5.11	
Weight (kg) / (lb)	5,8 / 12.7	

Tab. 5-1: Technical data



## operating instructions - urea electric diaphragm pump

### 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.



#### NOTE

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

- Use clamps to connect the pump to a power source according to the specifications on the type plate: 12 V or 24 V.
- Lay the power cable in a way that avoids any risk of stumbling.

Carry out the following steps when connecting the pump to the battery:

- The switch of the pump must be in the OFF position.
- Remove the protection cap from the positive battery terminal (+).
- Connect the red terminal clamp to the positive battery terminal.
- Remove the protection cap from the negative battery terminal (-).
- Connect the black terminal clamp to the negative battery terminal.

Proceed in reverse order when disconnecting the pump from the battery:

At first, disconnect the black clamp from the negative terminal and then the red clamp from the positive terminal. Put the protection caps on the terminals again.



#### CAUTION

##### Risk of injury from 12 V / 24 V batteries

- When handling the 12 V / 24 V battery (lead-acid battery), observe the specifications and the material data safety sheet of the battery manufacturer.

### 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.

## **operating instructions - urea electric diaphragm 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.



### **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.

## operating instructions - urea electric diaphragm pump (CB)

- 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.

### 9.1 Replacing the fuse

Open the fuse holder.

Pull the defective fuse out of the fuse holder and replace it by a new one with the same current rating.

Close the fuse holder.

## 10. Troubleshooting

Malfunction	Cause	Solution
Motor does not run	▶ No power supply	▶ Check the electric connections
Motor is too hot	▶ Incorrect voltage	▶ Verify that the voltage is correct
Motor runs at start slowly	▶ Supply voltage low	▶ Verify voltage
Discharge rate too low	▶ Discharge hose kinked or clogged ▶ Suction line resistance too high  ▶ Filter resistance too high ▶ Nozzle valve not completely open	▶ Check the discharge hose  ▶ Suction line too long, kinked, clogged or too many bends ▶ Check the suction filter and the check valve ▶ Check and clean the suction filter ▶ Completely open the nozzle valve
Pump runs too loudly	▶ Incorrect voltage ▶ Air entry in the suction line ▶ Feed quantity too low ▶ Suction tank without pressure compensation	▶ Verify voltage (12 V/12 V; 24 V/24 V) ▶ Check the airtightness in the suction line ▶ Tank almost empty or empty ▶ Dirty suction filter ▶ Sufficiently ventilate suction tank, for example by means of FMT vent valve (45 150)
Leak	▶ Defective diaphragm ▶ Defective O-ring	▶ Replace the diaphragm kit (80 864) ▶ Replace the O-ring (82 869)
Pump rotates with difficulty	▶ Deposits or foreign materials in the pump ▶ Pump is frozen (temperature too low)	▶ Clean the pump  ▶ 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.

Tab. 10-1: Troubleshooting



## **operating instructions - urea electric diaphragm pump**

### **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@fntag.ch](mailto:service@fntag.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>25 281 (12 V)</b> <b>25 282 (24 V)</b>
Motor voltage	12 V / 24 V
Weight	5 / 6 kg
Power	0,22 kW / 0,22 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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Dipl.-Ing. Rudolf Schlenker  
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**operating instructions - urea electric diaphragm pump**

**14. Mounting dimensions of the urea electric diaphragm pump (in mm)**

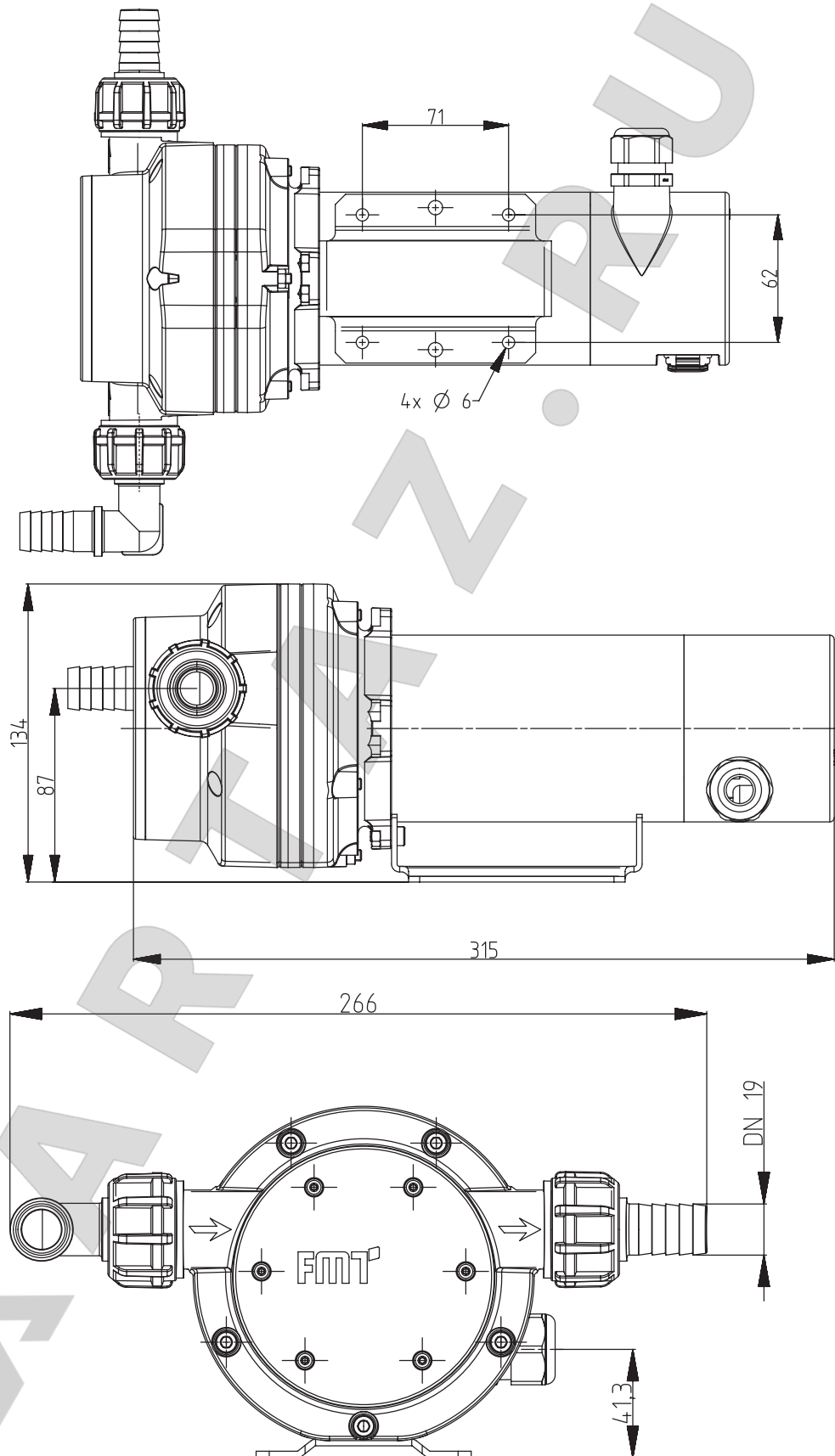


Fig. 14 -1: Mounting dimensions of urea electric diaphragm pumps (in mm)

## operating instructions - urea electric diaphragm pump

### 15. Overview of components of the urea electric diaphragm pump

Pos.	Quantity	Description	12 V	24 V
		Pump body assembly		82 832
1	1	ELM-urea electric diaphragm pump	86 866	80 869
2	2	Cable lug, blue, fully insulated		85 062
3	2	Cylinder screw M 5x12		86 770
4	1	Plate		89 882
5	2	Sealing ring		80 638
6	1	Foot pump 12-24V AdBlue		80 628 878
7	5	Cap screw M 5x55		86 893
8	1	Spare parts for urea electric diaphragm pump 35 l/min		80 864
9	2	Nut G1 blue		82 857
10	1	Circlip		82 862
11	4	O-ring FKM 80 - 19,2x3		82 859 878
12	1	Angle 90 straight		82 861
13	1	Nipple		82 858
14	1	Bypass spring		82 836
15	6	Plastic screw 4x22		86 768
16	1	Bypass valve		82 837
17	6	Plastic screw 3x16		86 769
18	1	Cover		82 834
19	1	X-ring EPDM 37,77x2,62		86 985
20	1	Pump housing		82 833
21	5	Fillister head screw STS plus		82 845
22	5	Tension plate DIN6796-Ø4		82 846
23	5	Screw M 5x10		80 730
24	1	Ball bearing DIN625-1 6203 ZZ		82 855
25	1	Swash cross		82 844
26	7	Hexagonal nut DIN 934		86 773
27	1	O-ring-HNBR N3831		82 869
28	1	Countersunk screw M 4x10		84 012
29	1	Eccentric flange -for 50Hz		82 864
30	1	Feather key DIN 6885 A		00 602
31	1	Waterproof switch		83 697
32	1	Cable gland M 20 x 1,5 mm		86 855
33	2	Fillister head screw M 4x12		00 468
34	1	Switch housing, cylindrical, radially sealed AdBlue		80 634
35	1	O-Ring-NBR 70-78,99x1,78		86 026
36	1	Cable with clamps and fuse holder		80 725
37	1	Flat fuse 25 A		89 434

Tab. 15-1: Overview of components for fig. 16-1

**operating instructions - urea electric diaphragm pump**

**16. Exploded view of the urea electric diaphragm pump**

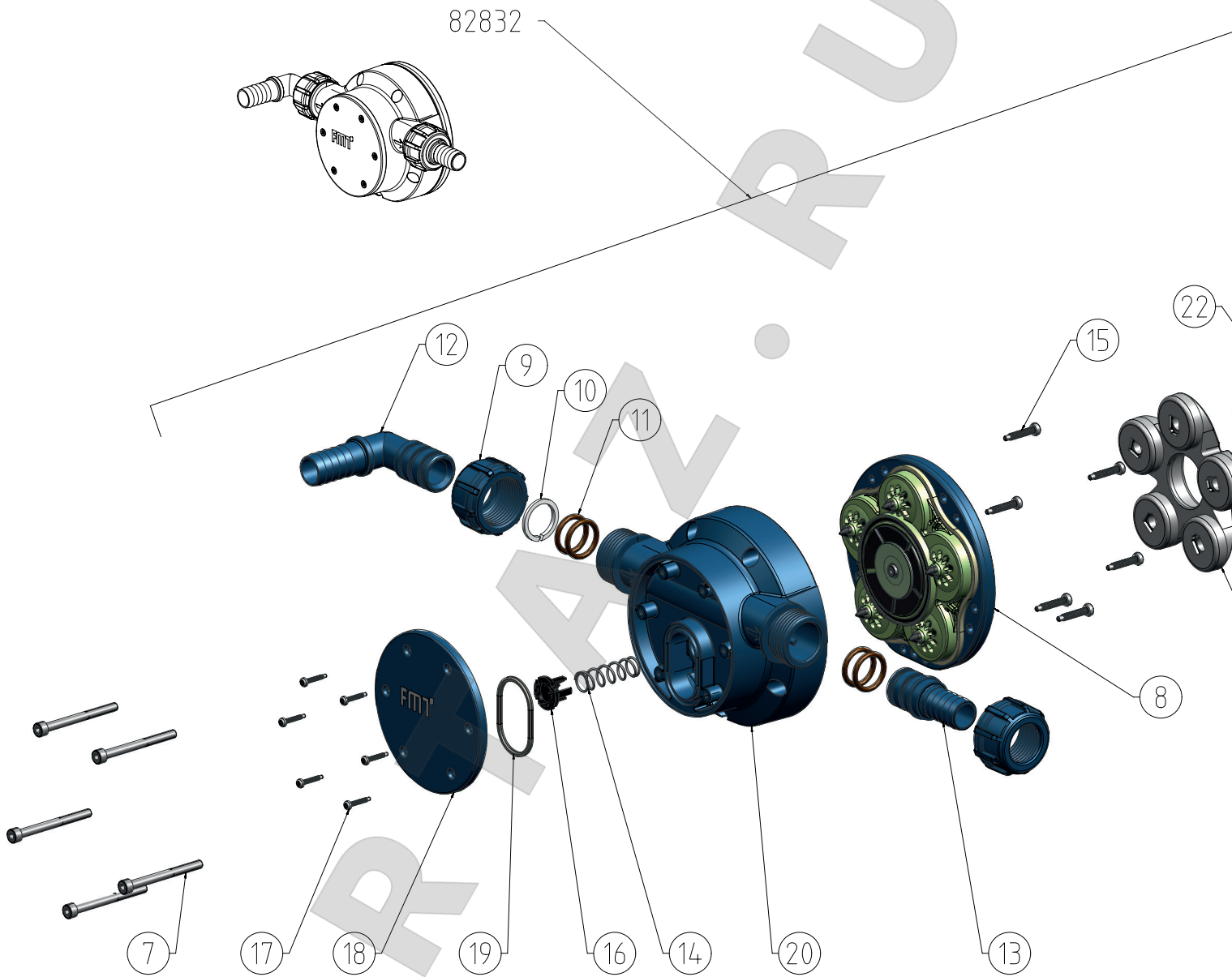
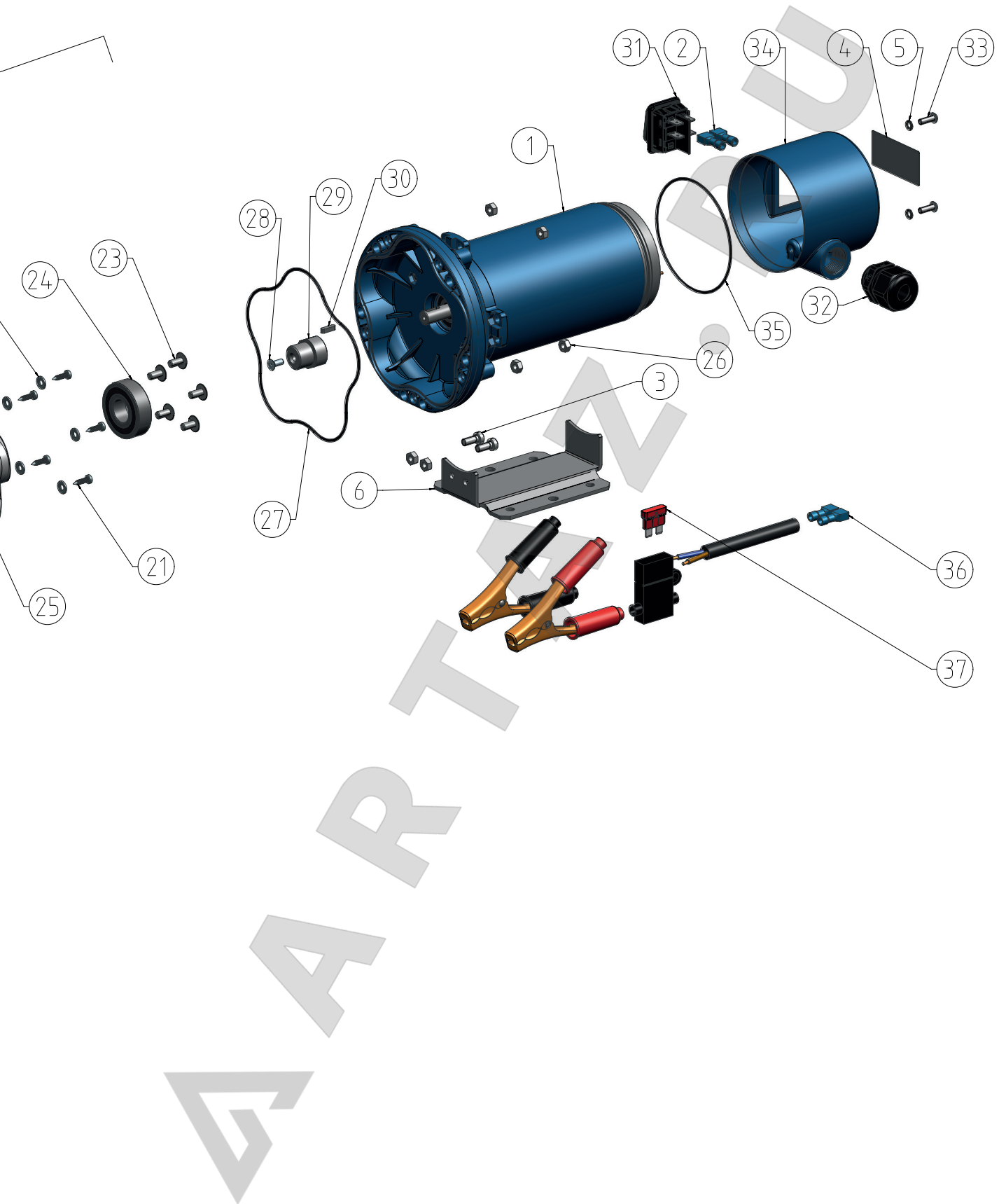


Fig. 16-1: Exploded view of the urea electric diaphragm pump



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