OPERATING INSTRUCTIONS AND SAFETY NOTES

PREMAxx DEF axial gear pump

230 V~AC • 120 V~AC • 12 V-DC

87 952 006 A801 US

FMT Swiss AG

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

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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 on the PREMAxx DEF axial gear 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
- Consquences 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
DANGER	Imminent threat of danger	Death or serious bodily injury
WARNING	Possible threat of danger	Death or serious bodily injury
CAUTION	Possibly dangerous situation	Minor bodily injury
ATTENTION	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 PREMAxx DEF axial gear 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 PREMAxx DEF axial gear 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 pump. Immediately identify and eliminate the cause in order to avoid consequential damages.
- Observe the safety sheet for DEF.

2.3 Intended conditions of use

The PREMAxx DEF axial gear pump is an electrically driven pump for the delivery of DEF (AdBlue®).

The temperature of the conveying liquid must be between –5 °C and + 35 °C (23 °F to 95 °F).

The DEF 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.

The use in explosive environment is prohibited.

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.
- Pumping caustic or other hazardous chemical or biological substances is forbidden.

2.4 Risks when handling the PREMAxx DEF axial gear 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.
- Never leave the pump unattended.
- Check to ensure that the pump does not work against the closed nozzle.

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 (VawS).

2.5 Risks in handling DEF solutions

The DEF concentrate is not inflammable, not explosive and not oxidizing.

NOTE

For cleaning, flush equipment with water. Dispose of released contaminated fluid. As a non-hazardous liquid waste, it should be solidified with stabilizing agents. Avoid release to the environment.

DEF 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 DEF.

3. Transport and temporary storage

Before transport, ensure that there is no liquid (DEF residues) in the pump.

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 (23 °F to 131 °F)

4. Construction and functional description

The PREMAxx DEF axial gear pump is an electrically driven pump for the delivery of DEF (AdBlue®). It is only designed for use as a barrel pump and can be screwed on storage barrels or containers.

The DEF axial gear pump is s a compact and handy pump, it' s not self-priming. It is quickly ready for use thanks to its integrated priming stage, which allows to manually pump small quantities of fluid before commissioning or in case of a power failure.

The pump housing is made of high-quality, impact-resistant plastic.

Numerous accessories from FMT allow a simple and quick mounting on every installation.

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

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 electric motor.

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

Pump data ⇨ Chapter Technical Data.

The PREMAxx DEF axial gear pump is available in the following versions:

– PREMAxx DEF, 52 l/min / 13.7 gpm, 230 V-1~AC-50 Hz

– PREMAxx DEF, 52 l/min / 13.7 gpm, 120 V-1~AC-60 Hz

– PREMAxx DEF, 38 l/min / 10 gpm, 12 V-DC-battery terminal clips

The pump can be equipped with different nozzle valves:

– with a standard nozzle valve or

– with an automatically closing nozzle valve

The pump can be delivered in a set including:

– PREMAxx DEF in the above-mentioned motor variants

– Hose kits

– Nozzle valve in one of the above-mentioned versions

4.1 Area of application

The PREMAxx DEF axial gear pump is only suitable for the delivery of DEF (AdBlue®).

The temperature of the delivery fluids must be between –5 °C and +35 °C (23 °F to 95 °F). The temperatures must not be above or below these limit values.

Since the motor and the switch are not explosion-protected the PREMAxx Axial Gear Pump must **not** be operated in an explosion risk area!

5. Technical data

Description	**230 V 23 739**	**120 V 23 739 006**	**12V 23 760**
Connecting cable, length (m) / (ft)		2 / 6.6	
Connection container		G 2“ male, drum adapter	
Connection suction side		Hose fitting DN 19	
Connection discharge side		G 1“ male	
Hydraulic data			
Pump design		axial gear	
Delivery rate under free discharge up to (l/min) / (gpm)	52 / 13.7	52 / 13.7	38 / 10
Suction height up to (m) / (ft)	2,5 / 8.2	2 / 6.6	2,5 / 8.2
Discharge height max. (m) / (ft)		15 / 49.2	
Pumping media		DEF	
Motor data			
Voltage (V)	230	120	12 DC
Frequency (Hz)	50	60	
Power consumption (A)	1,8	1,8	14
Power (kW)	0,32	0,32	0,18
Thermal protection		self resetting	
Duty cycle		continuous operation	
Rotation speed at 0,5 bar counterpressure (rpm)		7500	
Sound pressure level dB(A)		<70	
Type of construction		IMB 5	
Protection class		IP 34	
Material of pump housing and pump		PA6	
Material motor shaft		stainless steel 1.4021	
Dimensions of pump L x W x H (mm) / (inch)		130 x 130 x 350 / 5.1 x 5.1 x 13.7	
Weight (kg) / (lb)		2,5 / 5.5	

Tab. 5-1: Technical data

6. Installation

The PREMAxx DEF axial gear pump is designed for installations in indoor and outdoor areas.

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

NOTE

Before proceeding to the next step, please note the following:

When the pump is mounted on the storage container, the suction hose with the suction tube must be long enough to reach the liquid in the storage container even at low fluid levels.

- Cut the suction hose (6) to the desired length.
- Push the hose clamp (5) over the suction hose (6).
- Push the suction hose (6) on the suction port (4) on the pump.
- Push the hose clamp (5) to the suction port (4) and fasten the hose clamp by means of a screwdriver.

NOTE

Do not overtighten the hose clamp at the suction port, because otherwise the check valve may be jammed and the pump may stop working.

CAUTION

Risk of minor personal injuries

- Mount and operate the pump only in vertical position on a storage container.
- The pump is only allowed to be operated if it is firmly screwed with the dispensing container, so that it cannot carry out any uncontrolled movements.
- The pump is only allowed to be operated if the dispensing container, to which the pump is connected, stands on a firm and level surface.

- Screw the pump firmly into the opening of the storage container by means of the barrel screw coupling (3).
- When screwed in, the pump outlet can be moved to any desired position by turning the pump housing (1).
- Screw the union nut (14) of the discharge hose down to the discharge port (13) of the pump.
- Screw the free end of the discharge hose with the union nut (16) down to the thread of the nozzle valve (11).

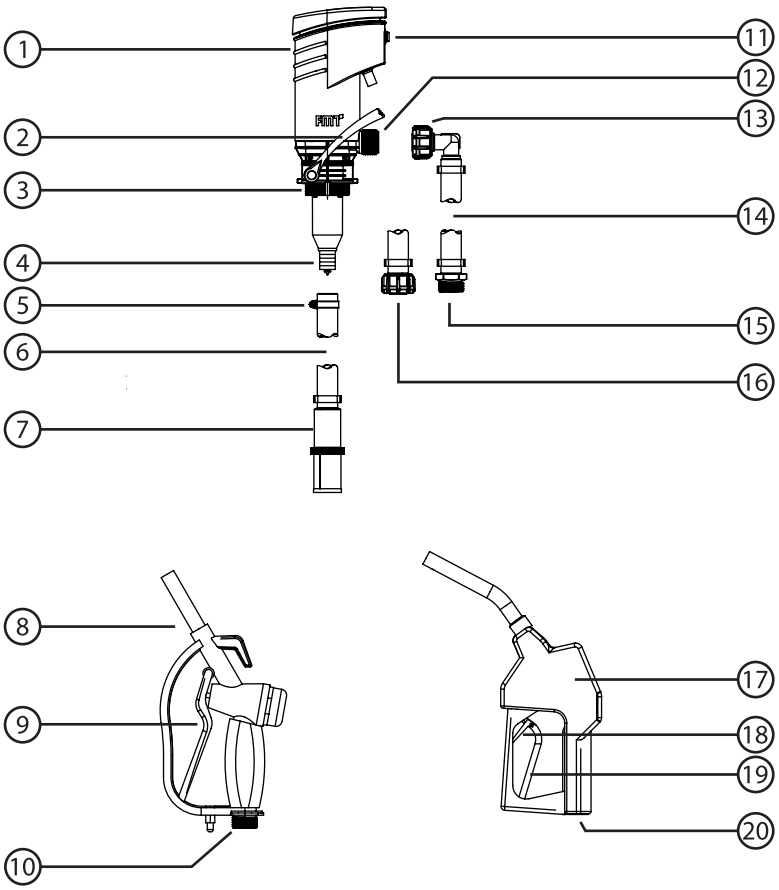

Fig. 6-1 Overview of PREMAxx DEF axial gear pump with acessories

1	Pump housing	11	On/off switch
2	Hand lever	12	Discharge port
3	Barrel screw coupling	13	Union nut, discharge hose
4	Suction port	14	Discharge hose
5	Hose clamp	15	Connection standard nozzle valve
6	Suction hose	16	Connection automatic nozzle valve
7	Stainless steel foot valve with strainer	17	Automatic nozzle valve
8	Standard nozzle valve	18	Lock
9	Nozzle valve lever, standard nozzle valve	19	Nozzle valve lever, automatic nozzle vale
10	Thread, standard nozzle valve	20	Thread, automatic nozzle valve

- Connect the pump to a power source using the mains plug or the terminal clamps.
- The pump is ready for commissioning.

CAUTION

Risk of injury from 12 V batteries

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

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.

7. Operation

7.1 First and re-commissioning

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

Check the PREMAxx DEF axial gear pump and the installed accessories for completeness and damage. Replace any damaged components immediately. Never use a pump if damaged.

CAUTION

Danger of product damage

- Operate the pump by hand before putting the pump into operation for the first time or if the fluid column has dropped down, because the radial shaft seal may be destroyed by a dry run of the pump.

Preparing the pump for operation (see fig. 6-1):

- Hold the nozzle valve (9 or 17) into a container.
- Push the lever (10 or 19) or fix it by the lock (18) (if equipped with automatic nozzle valve). Hold the nozzle valve into the container to be filled.
- Manually pump fluid by means of the hand lever (item 2, refer to fig. 6-1) until fluid is pumped out of the nozzle valve (9 or 17).
- Actuate the rocker switch to switch on the pump.

CAUTION

Danger of product damage

- Never operate the pump without liquid. The DEF pump may be damaged by running dry.
- Mount and operate the pump only in vertical position on a storage container.
- The DEF axial gear pump does not switch off automatically, therefore never let the pump running without supervision during filling operations.

- 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.

8. Preventive maintenance

In general, the PREMAxx DEF axial gear 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 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 DEF from crystallizing inside the pump system.
  Finally, thoroughly clean pump and system.

10. Troubleshooting

Malfunction	Cause	Solution
Motor does not run	▸ No power supply	▸ Check the electric connections
Discharge rate too low	▸ Discharge hose kinked or clogged	▸ Check the discharge hose
	▸ Suction line resistance too high	▸ Check the suction line, it may be kinked or clogged ▸ Check the suction filter
	▸ Filter resistance too high	▸ Check and clean the suction filter
	▸ Nozzle valve not completely open	▸ Completely open the nozzle valve

Tab. 10-1: Troubleshooting

11. Repair/Service

The PREMAxx DEF 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 NA

Phone 1-844-601-9115

12. Disposal

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

Dispose of in accordance with all local, regional and federal regulations.

Only qualified personnel is authorized to disassemble and dispose of the PREMAxx DEF axial gear pump.

13. EC Declaration of Conformity

CE

Manufacturer:

FMT Swiss AG

Fluid Management Technologies Swiss AG

Gewerbestraße 6

6330 Cham / Schweiz

Declares under his sole responsibility that the machine:

Model type	**PREMAxx DEF axial gear pump** **23 739 (230 V)** **25 739 006 (120 V)** **23 760 (12 V-DC)**
Motor voltage	230/120/12 V
Weight	2,5 kg
Power	23 739 (230 V) - 0,32 kW 25 739 006 (120 V) - 0,32 kW 23 760 (12 V-DC) - 0,18 kW
Function	Conveying of DEF (AdBlue®)

Complies with all relevant provisions of the following Directive:	
EC Directives	2006/42/EG Machinery Directive
Applicable standards	EN 809:1998+A1:2009+AC:2012 EN ISO 12100:2010 EN 60204-1:2006+A1:2009 EN 60335-1:2012+A11:2014

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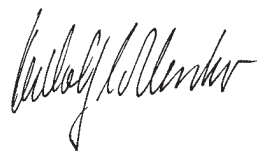

Dipl.-Ing. Rudolf Schlenker

(Managing Director)

14. Exploded view of the PREMAxx DEF axial gear pump 230 V

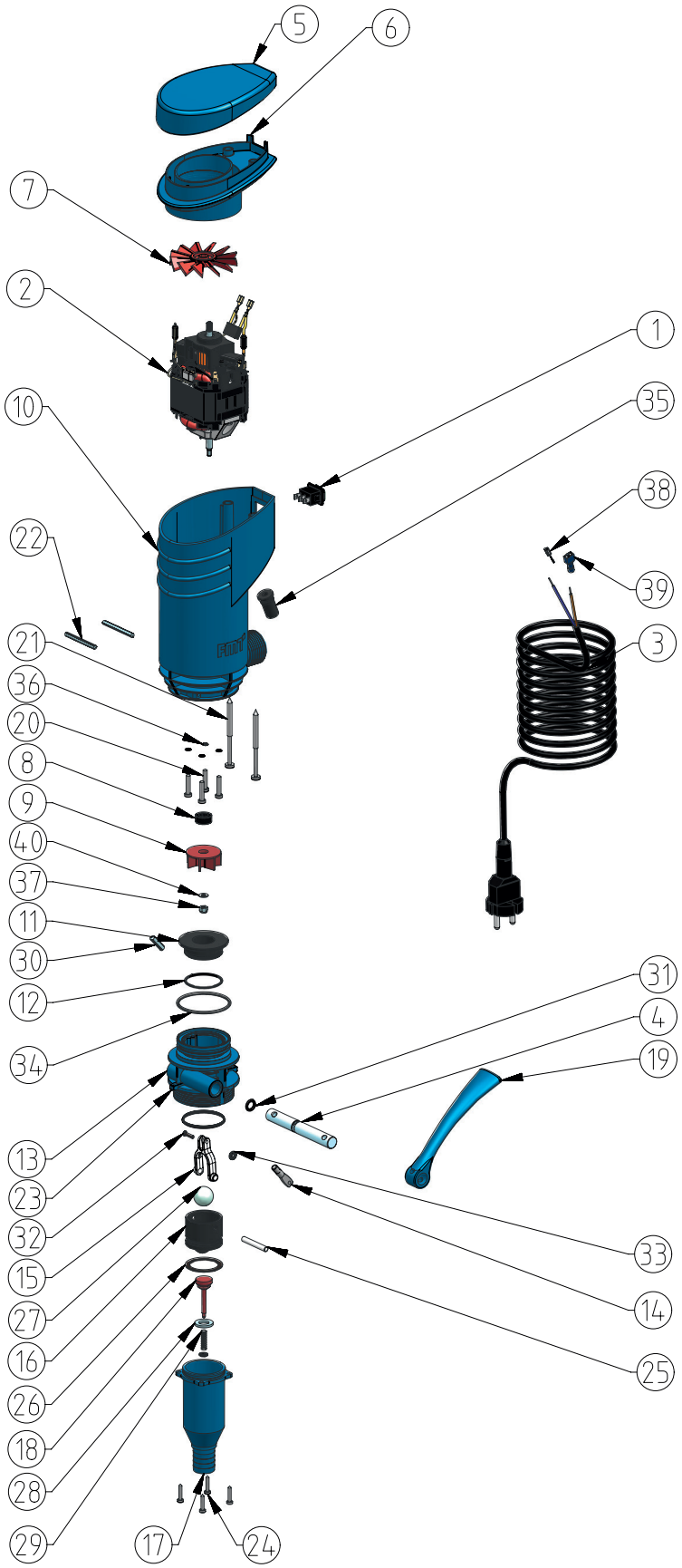

Fig. 14-1: Exploded view of the PREMAxx DEF axial gear pump 230 V

Pos.	Quantity	Description
1	1	Rocker switch, illuminated in green
2	1	ELM-230 V-50/60 Hz-0,30 KW
3	1	Cable H05 RN F2 G 1,0-2 m
4	1	Pump shaft PREMAxx VA
5	1	Housing cover, pump
6	1	Intermediate cover, pump
7	1	Fan propeller
8	1	Shaft seal ring 6 x 16 x 7 mm
9	1	Impeller for PREMAxx
10	1	Housing PREMAxx pump
11	1	Spacer
12	1	O-ring-FKM
13	1	Fitting PREMAxx pump
14	1	Threaded bolt PREMAxx pump
15	1	Con-rod for PREMAxx pump
16	1	Piston
17	1	Pump cylinder
18	1	Valve cone
19	1	Lever
20	4	Screws
21	2	Chipboard screw
22	2	Grooved taper pin DIN 1471
23	1	O-ring-FKM 70 - 35x2,0
24	4	Screw for plastic 3x16
25	1	Con-rod bolt PREMAxx pump
26	1	Piston seal
27	1	Ball D = 19,05 mm
28	1	Flat seal
29	1	Compression spring
30	1	Grooved taper pin DIN 1471
31	1	O-ring-FKM 70 - 7x2,5
32	1	Button-head rivet DIN 660
33	2	Safety washer
34	1	O-ring FKM 80
35	1	Cable sleeve support ID=6,5MM
36	4	O-ring-FKM 70 - 4x1
37	1	Hexagon nut DIN 985
38	1	Blade terminal DIN 46247
39	1	Blade terminal DIN 46245
40	1	Washer DIN 125

Tab. 14-1: Overview of the components of Fig. 14-1

15. Exploded view of the PREMAxx DEF axial gear pump 120 V

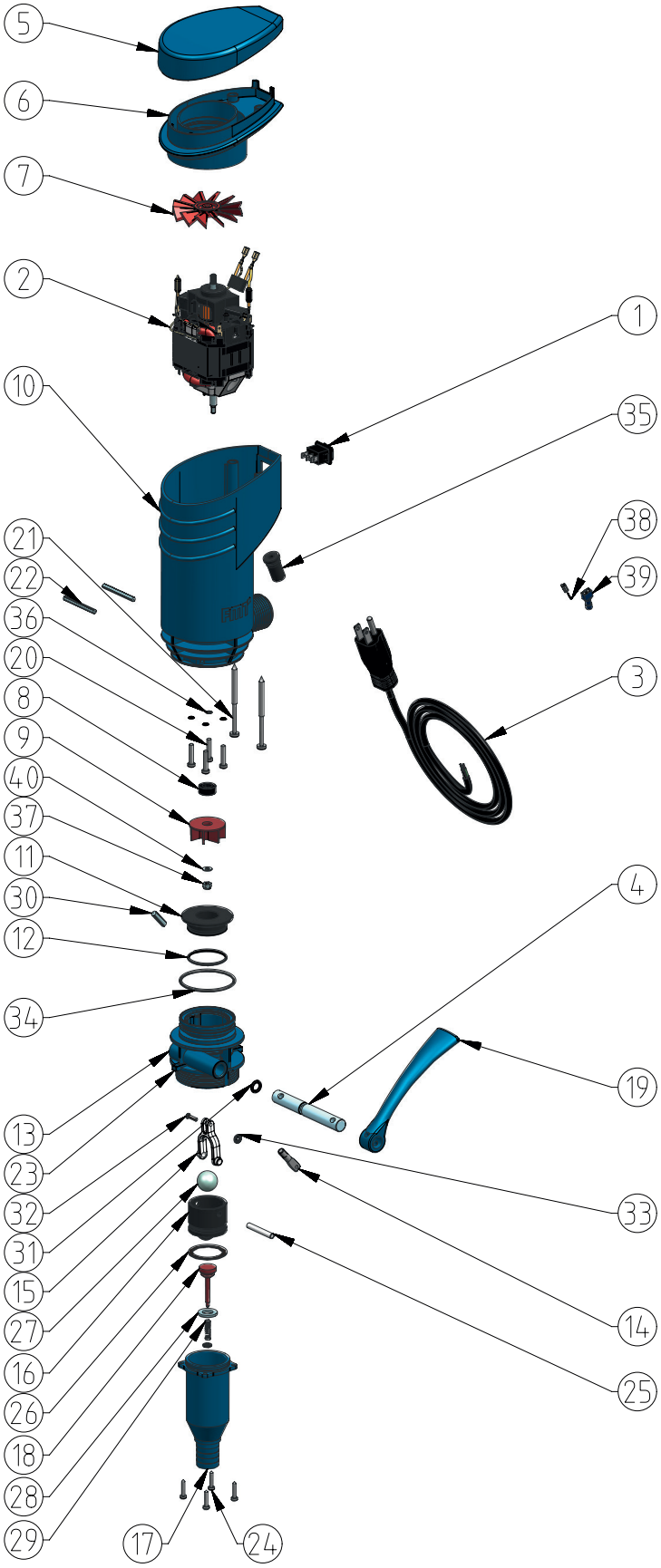

Fig. 15-1: Exploded view of the PREMAxx DEF axial gear pump 120 V

Pos.	Quantity	Description
1	1	Rocker switch, illuminated in green
2	1	ELM-electric motor 110/120 V-50/60 Hz-0,32 KW
3	1	Cable
4	1	Pump shaft PREMAxx VA
5	1	Housing cover, pump
6	1	Intermediate cover, pump
7	1	Fan propeller
8	1	Shaft seal ring 6 x 16 x 7 mm
9	1	Impeller for PREMAxx
10	1	Housing PREMAxx pump
11	1	Spacer
12	1	O-ring-FKM
13	1	Fitting PREMAxx pump
14	1	Threaded bolt PREMAxx pump
15	1	Con-rod for PREMAxx pump
16	1	Piston
17	1	Pump cylinder
18	1	Valve cone
19	1	Lever
20	4	Screw
21	2	Chipboard screw
22	2	Grooved taper pin DIN 1471
23	1	O-ring-FKM 70 - 35x2,0
24	4	Screw for plastic 3x16
25	1	Con-rod bolt PREMAxx pump
26	1	Piston seal
27	1	Ball D = 19,05 mm
28	1	Flat seal
29	1	Compression spring
30	1	Grooved taper pin DIN 1471
31	1	O-ring-FKM 70 - 7x2,5
32	1	Button-head rivet DIN 660
33	2	Safety washer
34	1	O-Ring FKM 80
35	1	Cable sleeve support ID=6,5MM
36	4	O-ring-FKM 70 - 4x1
37	1	Hexagon nut DIN 985
38	1	Blade terminal DIN 46247
39	1	Blade terminal DIN 46245
40	1	Washer DIN 125

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

16. Exploded view of the PREMAxx DEF axial gear pump 12 V

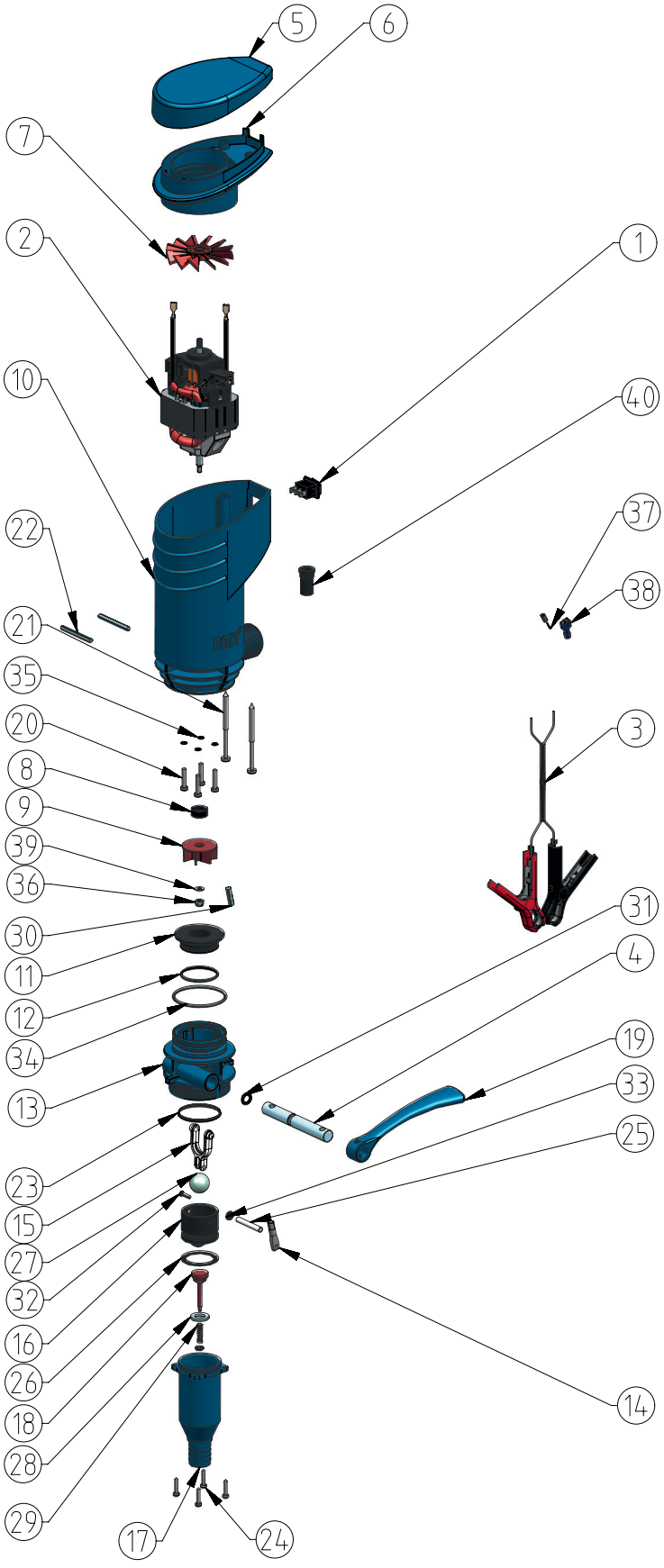

Fig. 16 -1: Exploded view of the PREMAxx DEF axial gear pump 12 V

Pos.	Quantity	Description
1	1	Rocker switch, illuminated in green
2	1	ELM-electric motor 12 V-0,22 kW
3	1	Cable
4	1	Pump shaft
5	1	Housing cover, pump
6	1	Intermediate cover, pump
7	1	Fan propeller
8	1	Shaft seal ring 6 x 16 x 7 mm
9	1	Impeller for PREMAxx
10	1	Housing PREMAxx pump
11	1	Spacer
12	1	O-ring-FKM
13	1	Fitting PREMAxx pump
14	1	Threaded bolt PREMAxx pump
15	1	Con-rod for PREMAxx pump
16	1	Piston
17	1	Pump cylinder
18	1	Valve cone
19	1	Lever
20	4	Screws 4 x 20
21	2	Chipboard screw
22	2	Grooved taper pin DIN 1471
23	1	O-ring-FKM 70-35x2.0
24	4	Screw for plastic 3x16
25	1	Con-rod bolt PREMAxx pump
26	1	Piston seal
27	1	Ball D = 19,05 mm
28	1	Flat seal
29	1	Compression spring
30	1	Grooved taper pin DIN 1471
31	1	O-ring-FKM 70 - 7x2,5
32	1	Button-head rivet DIN 660
33	2	Safety washer
34	1	O-ring FKM 80
35	4	O-ring FKM 70
36	1	Hexagon nut DIN 985
37	1	Blade terminal DIN 46247
38	1	Blade terminal DIN 46245
39	1	Washer DIN 125
40	1	Cable sleeve support ID=10 mm

Tab. 16-1: Overview of the components of Fig. 16-1

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