OPERATING INSTRUCTIONS AND SAFETY NOTES

Diesel pump

230 V 1~AC · 60 / 80 / 100 l/min

FMT Swiss AG

89 352 932 A806 GB

FMT Swiss AG

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

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Operating instructions translation

Date of issue: 11/2024

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

Table of Contents

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 diesel 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 safety notes

The safety 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 notes This means: please refer to chapter 2 for the safety instructions

2. Safety notes

Various dangers may occur if the diesel 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 diesel 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

Only qualified technical personnel is allowed to carry out repair work on the electrical system.

WARNING

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

- **Maintenance work is only allowed when the pump is currentless.**
- **Only qualified personnel is allowed to perform maintenance work.**
- **Allow the pump to cool down prior to maintenance and service work.**
- During cleaning work, wear gloves as a protection against skin-contact with diesel fuel.
- Keep to the specified inspection and maintenance intervals. (⇨**Chapter Maintenance**)
- Should unusual noises occur, immediately stop the diesel pump. Immediately identify and eliminate the cause in order to avoid consequential damages.

2.3. Intended conditions of use

The diesel pumps are to be used only for the delivery of diesel fuels and heating oil.

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.

The diesel pumps may only be connected to a suitable voltage source (see type plate).

Proper use also includes compliance with the operating instructions, which must be read in full before commissioning.

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.

2.4. Risks when handling the diesel pump

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 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.

Risk of stumbling because of power cable and fuel hoses!

- Lay the supply cable so that it will not cause any risk of stumbling.
- Provide fuel hoses of sufficient length and lay them so that they will not cause any risk of stumbling.

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.
- Only use genuine switches and power cables as replacement parts.
- With reference to the period of use, please note the details in ZH 1/A45.4.2 or DIN 20066 Part 5.3.2.

2.5. Risks when handling diesel fuels and heating oils

Diesel fuels and heating oils are flammable liquids, which must be taken into consideration for their storage. If improperly handled, they can cause risks to human health or to the environment.

Escaping liquids can cause environmental harm. Do not allow to enter sewage or ground water. Local and country rules and regulations relating to domestic water supplies and fuel storage must be obeyed.

DANGER

Use of diesel fuels

- May be fatal if swallowed and enters airways.
- Do not smoke, do not use open fire and do not weld when handling fuel.

Use of heating oil

- Heating oil may cause lung damage if swallowed.

NOTE

- Observe the safety sheet for diesel fuels and heating oils!

3. Transport and temporary storage

Prior to transport, ensure that there are no liquids in the pump (diesel fuel or heating oil residues) any more. All additional attachments must be removed from 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 -10 °C to + 40 °C

4. Design and functional description

The diesel pump can be used as portable or fixed unit.

It can be fitted with a variety of FMT accessories.

The diesel pump is available in the following versions:

- **Diesel pump 60 l/min 230 V-1~AC-50 Hz-EUS**
- **Diesel pump 80 l/min 230 V-1~AC-50 Hz-EUS**
- **Diesel pump 100 l/min 230 V-1~AC-50 Hz-EUS**

To avoid environmental damage, the diesel pump is equipped with a siphon protection system.

This means that if the discharge hose is damaged while the pump is stopped, siphon action will prevent the tank from being emptied.

4.1. Area of application

The diesel pump 60 l/min and 100 l/min is only suitable for the delivery of diesel and heating oil provided that they are not heated above their flash points.

The use in the food industry is forbidden.

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

The pump is not intended for use in ATEX areas.

The temperature of the delivery fluids must be between –10 °C and +40 °C. The temperatures must not be above or below these limit values.

DANGER

Risk of injury and material damage from explosive vapors

The motor and the switch of the pump are not explosion-protected

- **Do not operate the pump in an explosion-risk area! There is a risk of explosion!**
- **Smoking and nakes flames are prohibited in the vicinity of the pump.**
- Do **NOT** use the pump to deliver fuels of danger classification AI, AII and B.

NOTE

In addition to this documentation, all generally accepted safety rules, legal provisions as well as all other binding rules regarding occupational safety, accident prevention and environmental protection must be observed.

4.2. Requirements for the installation location

Filling facilities must be designed, installed, positioned, maintained and operated in such a way so as to ensure that no water pollution or other undesirable alterations of water properties occur.

According to the national laws, the operator of such an installation is responsible for continuously monitoring the compliance with the above stated requirements at the place of installation.

5. Technical data

Description		Diesel pump 60 l/min 23 430	Diesel pump 80 l/min 23 431	Diesel pump 100 l/min 23 433
Pump design			Vane pump, selfpriming	
Pumping media			Fuel oil and diesel	
Media temperature	°C		-10 / +40	
Delivery rate under free discharge up to	l/min	60	80	100
Discharge pressure up to	bar	1,8	1,9	2,2
Suction height up to	m		5	
Connection thread	G		1" female	
Airborne noise emission	dB(A)		< 70	
Motor data				
Insulation class			F	
Power consumption	A	3	4	5,7
Power	kW	0,6	0,75	1,2
Voltage	V		230	
Frequency	Hz		50	
Thermal protection			Self resetting	
Duty cycle	min		Continuous operation	
Rotation speed rpm	rpm	2800	2800	1400
Torque	Nm	1,27	2	4,1
Protection class		IP 66	IP 66	IP 54
Type of construction			IMB 3	
Materials of parts in contact with liquid				
Seals			FKM (Viton®) / NBR	
Pump housing			AlSi 12 (sea water resistant)	
Rotor			Gray cast iron 25	
Vane			POM	
Connecting cable	m		2	
Weight	kg	6,4	6,4	12,29
Dimensions LxWxH	mm	270 x 127,4 x 158,5	281,9 x 127,3 x 166,1	343,5 x 142 x 182

Tab. 5.-1: Technical data

6. Assembly

If the diesel pump is to be locally mounted, four M6 screws (not included in the delivery volume) are required.

The pump unit can be installed in 4 different positions (refer to fig. 6.-1).

- When installing the pump, ensure that it is mounted on a stable surface. Select a secure location (protected from splash water, damage and theft).
- If the pump is not secured with bolts, it must be operated on a firm, level and dry base.
- First, remove the plastic plugs from the suction and discharge junctions.
- Connect the hoses to the suction and delivery connectors. Attach a strainer to the end of the suction hose.
- Attach the nozzle valve to the delivery hose.

ATTENTION

- Before connecting the pump to the voltage source, check to ensure that the pump is switched off!

The pump is now ready for operation.

NOTE

- Ensure cleanliness during installation, and that all accessories/attachments are correctly connected and sealed.

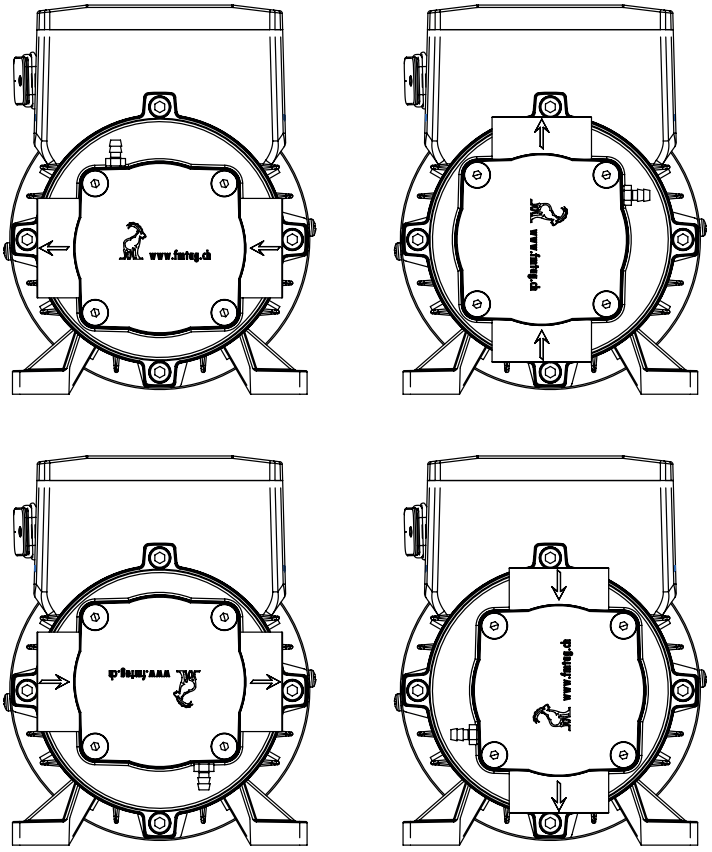

Fig. 6.-1: Possible assembly of the pump unit

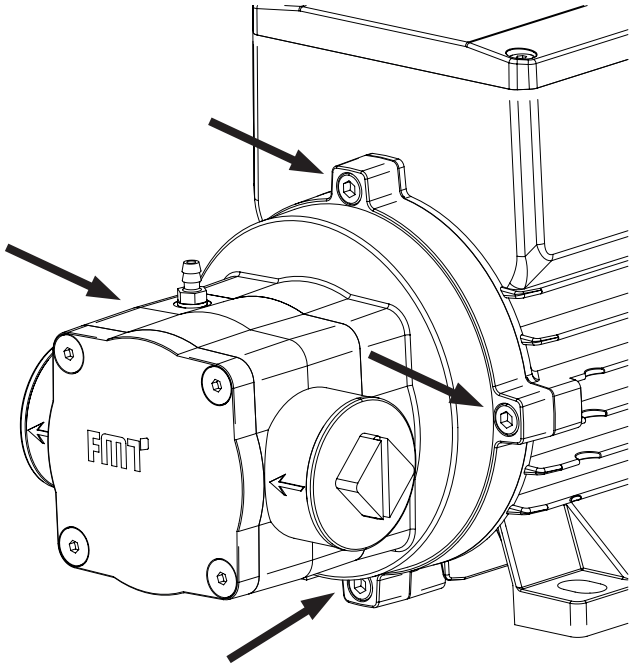

Fig. 6.-2: Position of the screws for changing the assembly of the pump unit

For changing the pump unit's position (⇨ see fig. 6.-1):

- At first, remove the 4 screws (⇨ see fig. 6.-2).
- Turn the pump unit 90° into the desired position.
- Insert the screws again.

ATTENTION

Risk of product damage

- Do not pull off the pump unit, turn it only.

6.1. Installing the siphon protection

Remove the screw and the seal located situated into the upper part of the pump housing (see fig. 6.1.-1).

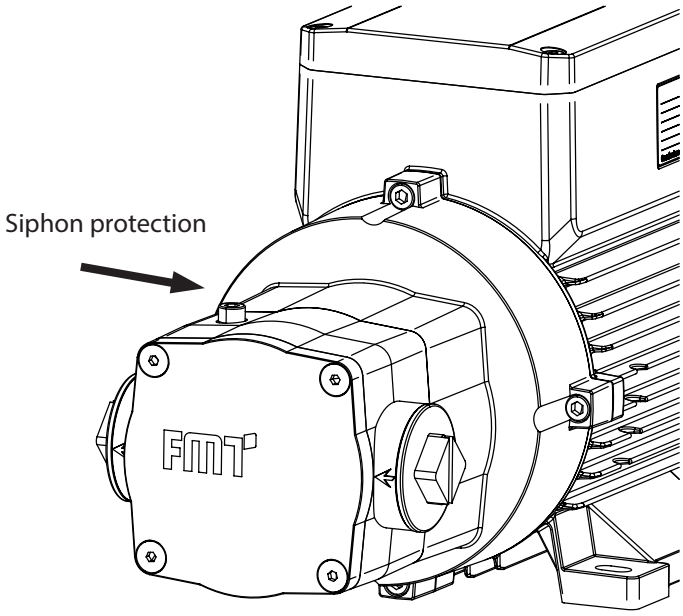

Fig. 6-1.1: Boring for siphon protection closed by screw (delivery state)

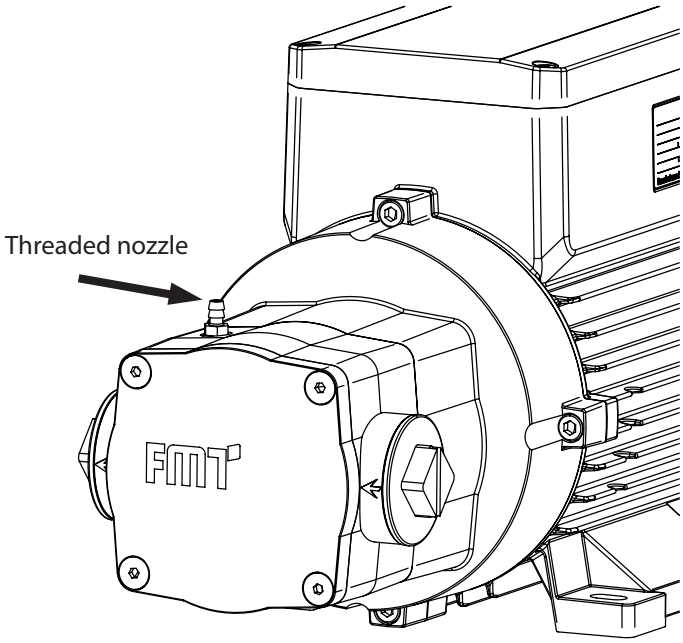

Fig. 6.1.-2: Threaded nozzle for siphon protection screwed in place

Screw into the same thread the threaded nozzle with the new seal (see fig. 6.1.-2).

Connect the hose to the threaded nozzle and feed it into the tank.

ATTENTION

- When installing the siphon protection, ensure that the end of the hose is not immersed in the fluid. Otherwise the siphon protection will not work!

7. Commissioning and operation

CAUTION

Risk of injury because of uncontrolled pump movement

- The pump may only be operated when it is fixed at the intended position close to the storage container.
- The pump is only allowed to be operated if it is firmly screwed down, so that it cannot carry out any uncontrolled movements.
- The pump may only be operated if the storage container, to which the pump is connected, stands on a firm and level surface.

Put the pump only in operation after it has been securely fixed at its place of installation.

Check the diesel pump and the installed accessories for completeness and damage. Replace any damaged components immediately. Never use the pump if damaged.

CAUTION

Risk of minor personal injury

- The pump may only be operated if the formation of electrostatic charges is avoided by a suitable potential equalization (grounding cable)!

- After initial start-up, check the pump and the connections for tightness.

NOTE

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

- 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 pump will not be protected against contamination by foreign bodies.

NOTE

To ensure that the tank can be completely emptied, the suction hose must reach to the bottom of the tank!

- Before switching on the pump, check to ensure that the nozzle valve is closed.
- Operate the rocker switch to switch on the pump.

CAUTION

- Never operate the pump for longer than 2 minutes without liquid. The pump may be damaged by running dry.

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 volume of delivery).

CAUTION

- The diesel pump does not switch off automatically, therefore never let the pump running without supervision during filling operations. Check to ensure that the pump does not work against the closed nozzle.
- After having finished the filling of a tank, check to ensure that the inlet and outlet hoses are empty before removing them.
- Wipe up immediately any spilled diesel fuel.

- For finishing the filling operation, release the nozzle valve control lever. Never operate the pump for longer than 2 min with closed nozzle valve.
- Operate the rocker switch to switch off the pump.
- Position the nozzle valve so that no diesel fuel 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 diesel pump only requires very little care or maintenance.

Maintenance work has always to be done by qualified technical personal.

DANGER

Danger of contact with energized components

- When working on the electrical system of the pump, disconnect the pump also from the power supply and protect it against restarting!

CAUTION

- Regularly check the hoses and their seals. Replace any damaged parts immediately.

In order to avoid environmental or equipment damage or personal injury, the following parts must be regularly checked and replaced if necessary:

- Pump housing / bypass 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:

DANGER

Danger of contact with energized components

- When working on the electrical system of the pump, disconnect the pump in addition from the power supply and protect it against restarting!
- Before performing any maintenance work, disconnect the diesel pump from all electric and hydraulic supply sources.

- Wear personal protective equipment when carrying out maintenance.
- 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.
- 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.

10. Replacement of worn vanes

Repair work may only be performed by qualified personnel.

- Loosen the screws item 22 (⇨ chapter 15), item 16 (⇨ chapter 16) and item 24 (⇨ chapter 17).
- Remove the complete bypass housing from the motor, item 18 (⇨ chapter 15 an 17) and item 13 (⇨ chapter 16) and the gaskets.
- Replace the worn vanes, item 8 (⇨ chapter 15 and 17) and item 20 (⇨ chapter 16) , by new genuine FMT spare parts. Observe the installation direction.
- Put the bypass housing, item 18 (⇨ chapter 15 and 17) and item 13 (⇨ chapter 16) , back in position and fasten it with the screws. Ensure the correct seat of the sealing rings.
- Replacing the vanes is only necessary in exceptional cases.

11. Troubleshooting

Malfunction	Cause	Solution
Delivered volume too low or no delivery	▸ Discharge hose kinked or clogged ▸ Resistance in the suction line too high ▸ Too many bends or fittings in the suction line ▸ Filter resistance too high ▸ Voltage too low ▸ Nozzle valve not completely open ▸ Suction line not tight ▸ Worn vanes	▸ Check the discharge hose ▸ Suction line too long or kinked, excessive suction height ▸ Use for example 45° bends, avoid use of bends ▸ Check, clean suction filter ▸ Check the voltage ▸ Completely open the nozzle valve ▸ Check and seal the suction line ▸ Replace worn vanes (⇨ chapter 10)
Delivery pressure too low	▸ Wrong direction of rotation ▸ Voltage too low ▸ Impurities ▸ Defective or clogged bypass in the pump	▸ Check the direction of rotation (connection to voltage supply) ▸ Check the voltage ▸ Clean the suction filter ▸ Check the bypass
Pump makes too much noise	▸ Air in the suction line ▸ Supply rate too low	▸ Check the suction line for tightness ▸ Clean the suction filter
Leakage at the pump	▸ Defective O-ring	▸ Replace the O-ring ⇨ chapter 15, 16 and 17; Exploded view
Difficulties with pump rotation	▸ Deposits or impurities in the pump housing ▸ Pump out of use for a long time	▸ Clean the pump ▸ Add some oil into the suction side of the pump

Tab. 11.-1: Troubleshooting

12. Repair/Service

The diesel pump has been developed and produced according to the highest quality standards.

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

FMT Swiss AG

Tel +49 9462 17-246

Fax +49 9462 1063

service@fmtag.ch

13. 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 the different materials.

Only qualified personnel is authorized to disassemble and dispose of the diesel pump.

14. EC Declaration of Conformity

CE

Manufacturer:

FMT Swiss AG

Fluid Management Technologies Swiss AG

Gewerbestraße 6

6330 Cham / Switzerland

declares under his sole responsibility that the machine:

Model	**Diesel pump 60 l/min 23 430** **Diesel pump 80 l/min 23 431** **Diesel pump 100 l/min 23 433**
Motor voltage	230 V
Function	pumping diesel fuels and heating oil
complies with all relevant provisions of the following directive:	
EC directives	2006/42/EC Machinery Directive 2014/30/EC EMC Directive
Applicable standards	EN 809; EN ISO 4144; EN 60204-1; EN 12100 : 2010; EN 55011

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FMT Swiss AG

Cham, 02.07.2018

Dipl.-Ing. Rudolf Schlenker

(Managing Director)

15. Exploded view of the diesel pump 60 l/min

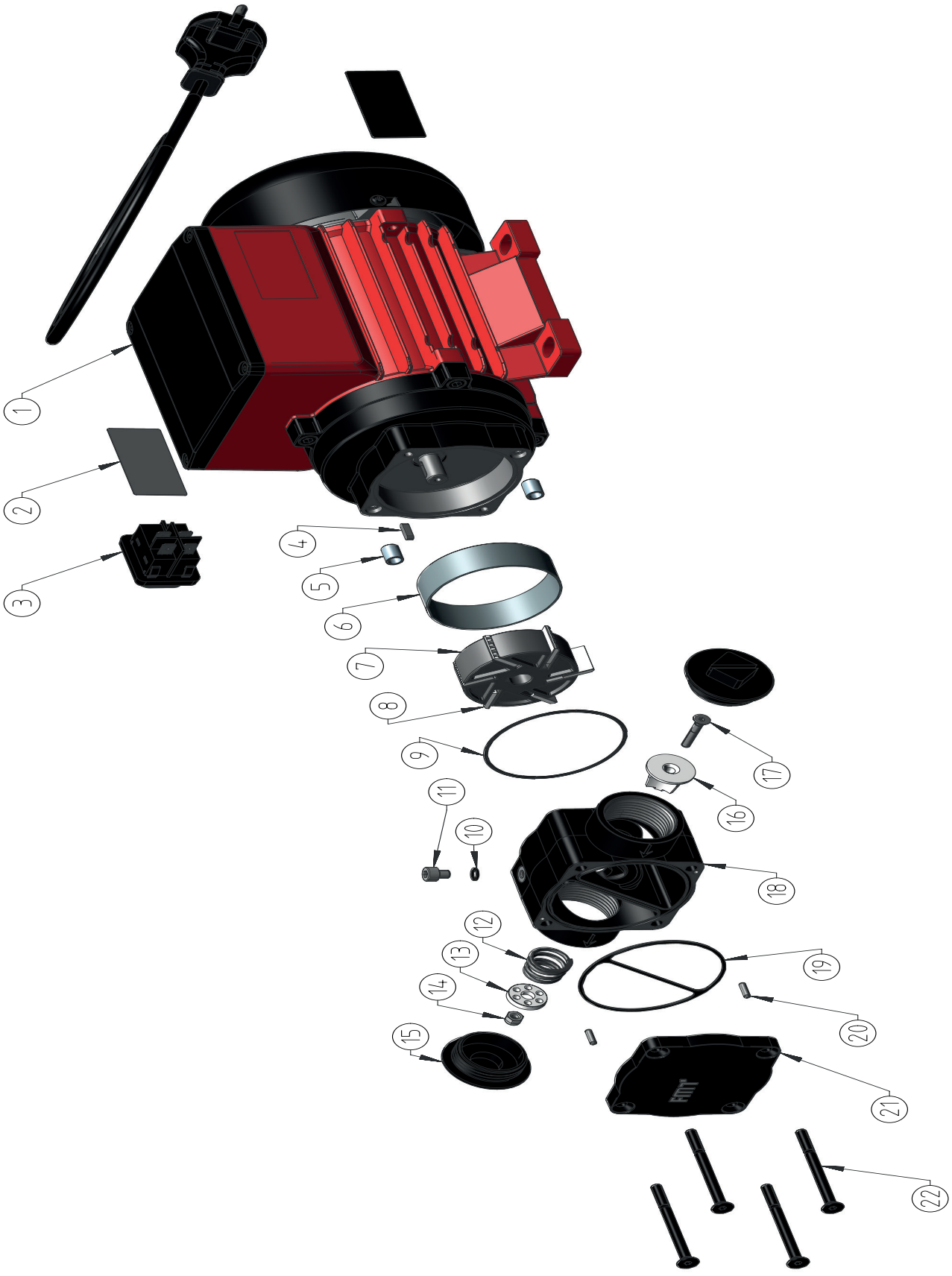

Fig. 15. - 1: Exploded view of the diesel pump 60 l/min

Item	Quantity	Designation	Diesel pump 60 l/min
1	1	Electric motor 230 V-50 Hz 60 l/min	83 704
2	2	Decal	89 882
3	1	Rocker switch	81 293
4	1	Feather key DIN 6885 A	00 602
5	2	Guide bush - blue galvanized	83 775
6	1	Raceway	82 471
7	1	Rotor 60 L chamfered slots	86 844
8	6	Vane	89 254
9	1	O-ring-NBR 70-62x1,5	82 673
10	1	Sealing ring	89 279
11	1	Cap screw M 5x6	89 445
12	1	Compression spring - tapered 2x13,5x16	89 384
13	1	Disc with bore holes for bypass	83 575
14	1	Nut DIN 985	03 496
15	2	Screw plug black PP 710GPN	86 055
16	1	Valve tappet	83 574
17	1	Countersunk screw M 4x25	83 400
18	1	Bypass housing	83 763
19	1	Cover gasket	82 515
20	2	Straight pin ISO 2338 - 3m6x10-St	85 637
21	1	Cover, bypass	83 762
22	4	Countersunk screw M 5x65	86 256

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

16. Exploded view of the diesel pump 80 l/min

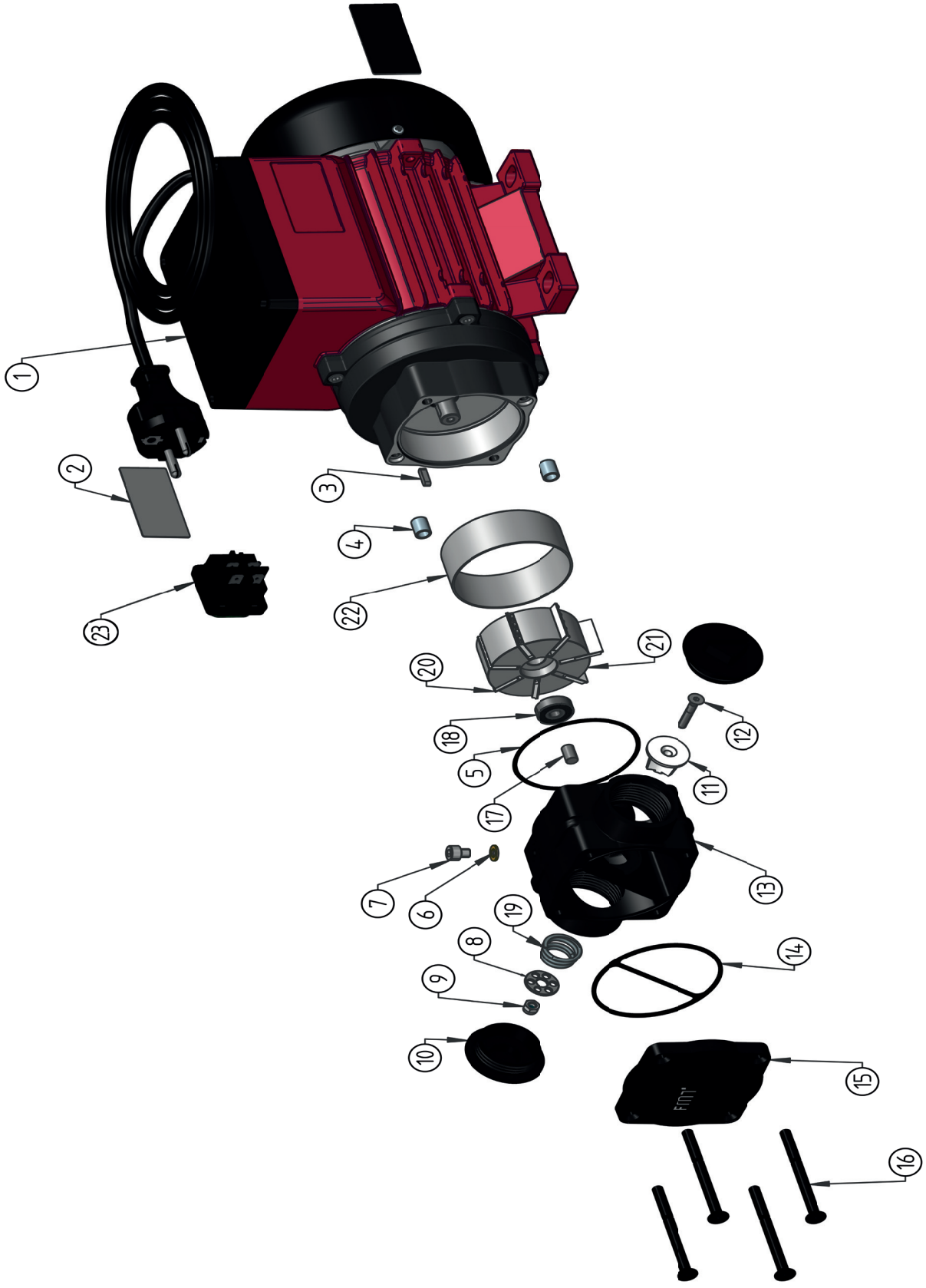

Fig. 16. -1: Exploded view of the diesel pump 80 l/min

Item	Quantity	Designation	Diesel pump 80 l/min
1	1	Electric motor 230 V-50 Hz 80 l/min	89 814
2	2	Decal	89 882
3	1	Feather key DIN 6885 A	00 602
4	2	Guide bush - blue galvanized	83 775
5	1	O-ring-NBR 70-62x1,5	82 673
6	1	Sealing ring	89 659
7	1	Cap screw M 5x6	89 445
8	1	Disc for bypass	83 575 001
9	1	Nut DIN 985	03 496
10	2	Screw plug black PP 710GPN	86 055
11	1	Valve tappet	83 574
12	1	Countersunk screw M 4x25	83 400
13	1	Bypass housing	83 763 001
14	1	Cover gasket	82 515
15	1	Cover, bypass	83 762
16	4	Countersunk screw M 5x65	86 256
17	1	Shaft bearing	83 997
18	1	Ball bearing	83 979
19	1	Compression spring	00 242
20	7	Vane	89 802
21	1	Rotor	89 803
22	1	Raceway	89 804
23	1	Rocker switch	81 293

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

17. Exploded view of the diesel pump 100 l/min

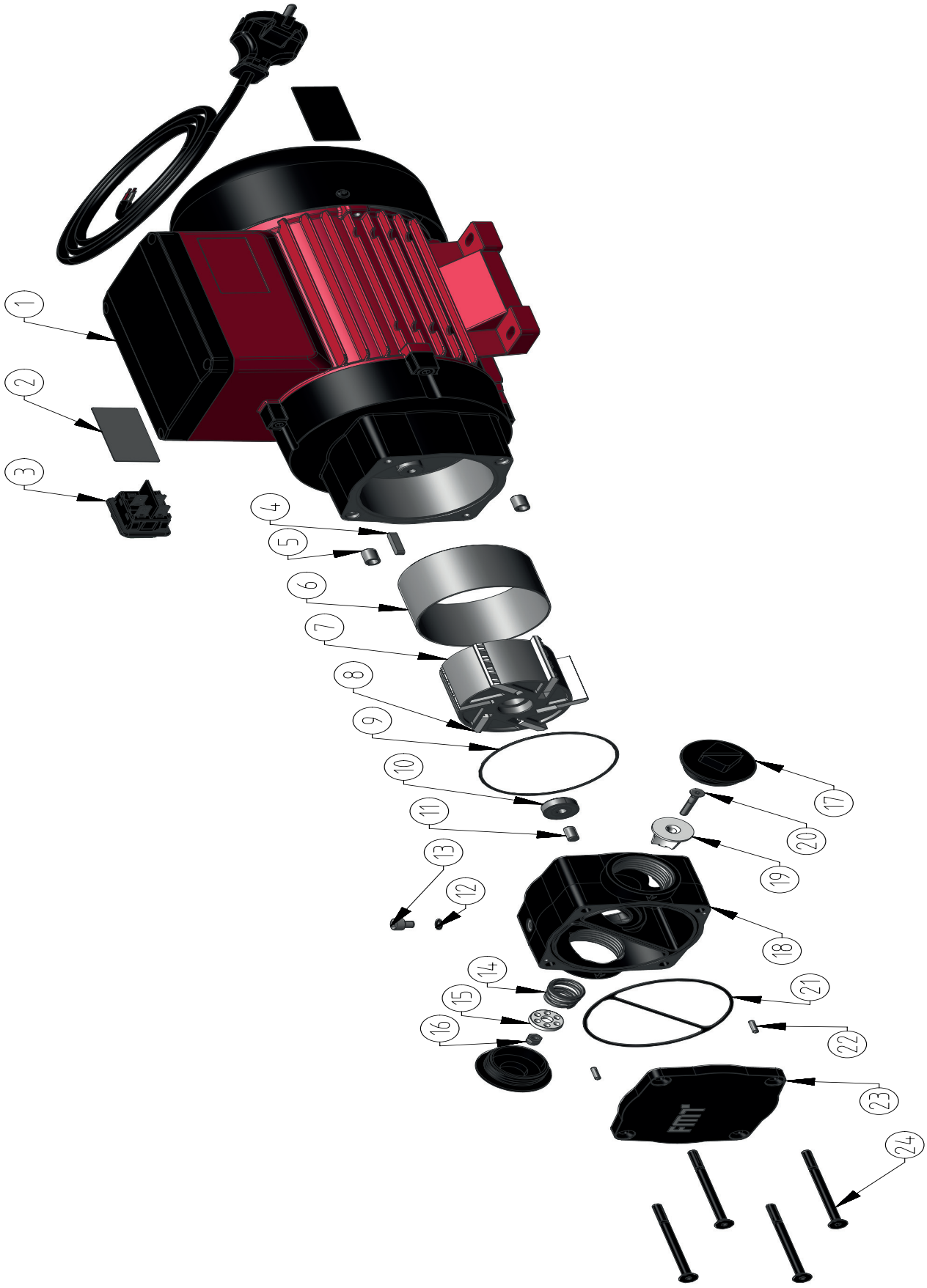

Fig. 16. -1: Exploded view of the diesel pump 100 l/min

Item	Quantity	Designation	Diesel pump 100 l/min
1	1	Electric motor 230 V-50 Hz 100 l/min	83 706
2	2	Decal	89 882
3	1	Rocker switch	83 697
4	1	Feather key DIN 6885 A	00 604
5	2	Guide bush - blue galvanzied	83 775
6	1	Raceway	82 524
7	1	Rotor 100 L chamfered slots	86 845
8	6	Vane	89 304
9	1	O-ring 72x1,5	82 661
10	1	Ball bearing D6xD19x6	00 253
11	1	Cylindrical pin DIN 7	91 466
12	1	Sealing ring	89 279
13	1	Cap screw M 5x6	89 445
14	1	Compression spring - tapered	89 384
15	1	Disc with borings for bypass	83 575 777
16	1	Nut DIN 985	03 496
17	2	Screw plug black PP 710GPN	86 055
18	1	Bypass housing	84 428
19	1	Valve tappet	83 772 777
20	1	Countersunk screw M 4x25	83 400
21	1	Cover gasket	84 432
22	2	Straight pin ISO 2338 - 3m6x10-St	85 637
23	1	Cover, bypass	84 430
24	4	Countersunk screw M 5x70	86 235

Tab. 17.-1: Overview of components for Fig. 17.-1

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