OPERATING INSTRUCTIONS AND SAFETY NOTES

mobiSERVE

Mobile with battery



FMT Swiss AG

81 231 932 A802 GB

FMT Swiss AG

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FMT Swiss AG
Fluid Management Technologies Swiss AG
Gewerbestraße 6
6330 Cham / Schweiz
Tel. +41 41 712 05 37
Fax +41 41 720 26 21
Email: info@fmtag.com
Internet: www.fmtag.com

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 mobiSERVE 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 mobiSERVE 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 mobiSERVE.

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 cleaning and repair



WARNING

- Wear suitable gloves as a protection against long-term skin contact with urea solution.
- The mobiSERVE is allowed to be cleaned by instructed personnel only.
- When handling urea solutions, adhere to the information provided on the material data safety sheet.

2.3 Intended conditions of use

The mobiSERVE urea conveying system has been designed for conveying urea solutions (urea, AdBlue®) or water from mobile tanks into containers provided for this purpose, for example vehicle tanks.

The urea conveying system is operated independently of the mains power.

The mobiSERVE is suitable for use in workshops.



WARNING

Never use it to deliver explosive fluids such as gasoline or other fluids with similar flashpoints!

The mobiSERVE is only allowed to be connected to an appropriate voltage source (see type plate).

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

The use in the food industry is forbidden.

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 is 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 mobiSERVE

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

Risk of injury from stumbling or falling because of improperly laid power lines.

Moving the device with defective castors and/or defective accessories is forbidden!

If the power cable is not used, this one must be disconnected from the mobiSERVE and kept in a safe place.

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.

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 its period of use.
- Damaged accessories and attachments must be replaced immediately.
- With reference to the period of use, please note the details in ZH 1A45.4.2 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.

3. Transport and in-house transport

All lifting and transport work may only be done by qualified and suitably instructed personnel. Only use the provided attachment points as well as approved lifting gear and slings to lift the mobiSERVE.

Use appropriate means to secure the mobiSERVE and the related individual parts on a means of transport / transport pallet.

It is not allowed to transport the urea conveying system with fitted urea dispensing container! Urea dispensing containers / urea cans must be transported separately. The manufacturer's transport provisions must be observed.



CAUTION

- It is forbidden to transport the mobiSERVE with plugged-in power cord.
- For a transport of the battery, the poles must be protected by caps and insulating tape.



WARNING!

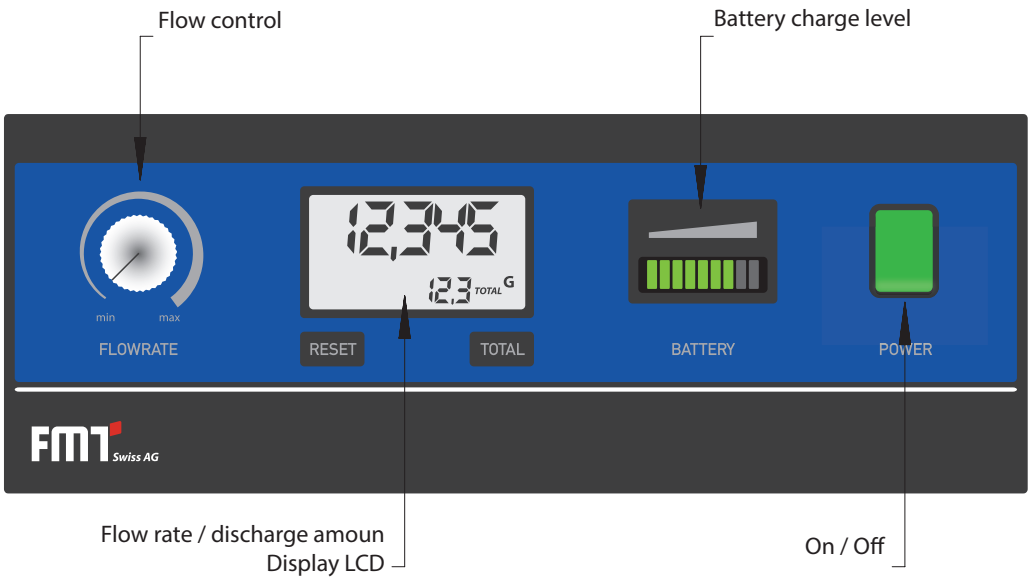
- Castors/tyres are provided for in-house transports. When moving the device, check to ensure that all flaps and doors are properly closed and that the urea container is safely placed on the mobiSERVE and is secured against falling!

4. Design and functional description

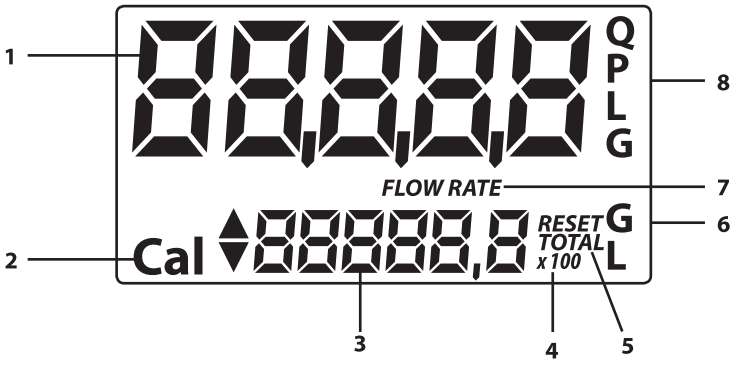
The mobiSERVE is a mobile refilling vehicle featuring an electronic counter with digital display.

The built-in pump is operated by an on-board lead accumulator. An integrated charger is provided to recharge the battery. The battery charge level is indicated on the control panel. The quantity delivered is measured by means of an electronic system featuring an oval gear meter.

A rotary knob allows to continuously adjust the flow rate in a defined range.



The LCD (liquid cristal display) of the mobiSERVEs is equipped with two numerical registers and various screens which only appear if needed by the current function.



Legend:

1. Register of the partial amount (5 digits with floating point: 0.000+99999), indicating the quantity issued since the last actuation of the RESET key
2. Display of the calibration modality
3. Register of the total amount (6 digits with floating point 0.0 - 999999x10/x100) that can show two types of total amounts:
   3.1 Total amount not resettable to zero (TOTAL)
   3.2 Total amount resettable to zero (RESET TOTAL)
4. Display of the multiplication factor of the total amount (x10/x100)
5. Display of the total amount type (TOTAL/RESET TOTAL)

6. Display of the total amount measuring unit; L = Liters; GAL = Gallons
7. Flow rate display
8. Display of the partial amount measuring unit:
   QTS = Quarters; PTS = Pints; L = Liters; GAL = Gallons;

The mobiSERVE is equipped with two push buttons (**RESET** and **TOTAL**) whereby each of them carries out two main functions. In combination, these two buttons perform other auxiliary functions.

Main functions:

1. **RESET-Taste**:
   to reset the partial amount register and the resettable total amount register RESET TOTAL.
2. **TOTAL key**:
   to call up the calibration mode of the unit. In combination, both keys allow to call up the configuration mode, where the measuring unit desired can be entered.

Main switch On/Off

Upon actuation of the main switch, the pump starts to work. The battery charge indicator shows the-battery status, and in the LCD display, the daily amount is indicated.

The pump's maximum duty cycle is 5 minutes. This prevents an uncontrolled pump operation, if accidentally the main switch has not been switched off.

When the unit is turned off and on again, the pump restarts to work. The LCD display remains active for 30 minutes after the main switch has been turned off.

Measuring chamber

The measuring chamber is located in the middle part of the unit.

The measuring chamber is equipped with oval gears. When rotating, these oval gears produce electrical impulses which are processed by the microprocessor on the electronic card.

The microprocessor works with a calibration factor (i. e. with a "weight" allocated to each impulse). The impulses produced during rotation are converted in fluid volumes expressed in the previously determined measuring unit and are displayed in the partial and total amount registers on the LCD screen.

All mobiSERVEs leave the factory with a calibration factor, called FACTORY K FACTOR, which amounts to approx. 1,000. The unit can be calibrated in order to optimally adjust the counter to the fluid to be measured.

It is possible at any time to return to the calibration set by the manufacturer.

Battery

The mobiSERVE is powered by a maintenance-free 12 V lead accumulator.

The battery compartment is located in the housing.

To replace the battery, the housing cover must be removed.

5. Commissioning and operation

Check the mobiSERVE and the assembled attachments for completeness and damage. Replace any damaged parts immediately and never use a damaged pump.



CAUTION

- Before working on the device, apply the locking brake of the castors.



CAUTION

- Never operate the mobiSERVE without a fluid for more than 2 minutes. Your urea pump may be damaged by dry running.
- It is forbidden to operate the unit with defective equipment.

Press the nozzle valve lever up according to the delivery rate desired or actuate the lock.

Operate the rocker switch to turn the mobiSERVE on.

Placing and filling the barrel:

Suitable devices are to be used to lift the urea container onto the space provided for it on the mobiSERVE. Check to ensure that the whole surface is used, because otherwise there is the risk that the urea container may fall backwards out of the trolley. In addition, the urea container must be secured against falling out.

200 liter mobiSERVE **25 352**

- Place the 200 l barrel on the load area of the trolley. Actuate the parking brakes of the two castors in order to ensure a secure and safe standing position.
- Insert the suction line into the barrel and connect the screw coupling and the barrel thread.
- Tighten the union nut in order to connect the preassembled hose and the suction line in the barrel. Check to ensure that the O-rings are not damaged at the connection.
- For an exchange of barrels, proceed in reverse order.

60 liter mobiSERVE **25 353**

- The 60 l trolley is equipped with a plastic container. The suction hose and the connecting hose are already preassembled in the barrel.
- You have the possibility to fill the container by an external filling operation. The suction hose is equipped with a SEC adapter, so that the container can be filled by means of the pump in the trolley.
- To do this, connect the SEC adapter to the existing IBC container.
- Open the red screw cap at the trolley container and insert the nozzle into this opening.
- Turn the rotary knob for flow control to 100 %.
- Switch the main switch on. The pump starts to work now.
- Open the nozzle valve and actuate the lock. The nozzle valve will automatically close when the container is full.
- Then, shut off the main switch and reconnect the SEC adapter to the suction line of the trolley container.



NOTE

In case of a refilling or after an exchange of a barrel, completely bleed the air from the system, in order to avoid measuring errors in the electronic counter system.

- To do this, open the second opening of the trolley container and insert the nozzle valve. Perform a filling operation as described under paragraph 5.1 until the medium is delivered without air.

The mobiSERVE is now ready for use.

5.1 Filling operation

- Approach the mobiSERVE to the vehicle to be refilled.
- During filling, the parking brake should be always applied at the rear castors in order to prevent an uncontrolled movement of the trolley.
- Insert the nozzle valve into the tank opening and turn the main switch on.
- The pump starts to work.
- The following information is indicated on the control panel: battery charge level, counted daily amount and total amount.
- Open the nozzle valve. As soon as the filling operation is completed, turn the main switch off again.



NOTE

The mobiSERVE is optionally delivered with a nozzle valve which allows to carry out a filling operation according to ISO 22241-5. Please refer to the operating instructions supplied with unit for information on the operation of the nozzle valve according to ISO 22241-5.

5.2 Adjusting the flow rate

The mobiSERVE is equipped with a flow rate control unit.

The infinitely variable flow rate can be adapted to the vehicle to be filled.

- To do this, turn the rotary knob "Flow Rate" in the range from min to max. The current flow rate can be indicated in the display.

Refer to ⇨ Paragraph **8.1.3.** Discharge and display of the current flow rate (flow rate mode).

6. Technical data

Designation		**mobiSERVE 200 l 25 352; 25 352 836**	**mobiSERVE 60 l 25 353; 25 353 836**
Pump design		Diaphragm pump, self-priming	
Delivery rate under free discharge	l/min	10-20, infinitely variable	6-12, infinitely variable
Discharge pressure up to	bar	1,7	
Pumping media		Urea (AdBlue®) or water	
Motor data			
Power consumption	A	18	
Voltage	V	12 V DC	
Fuse	A	25	
Protection class	IP	54	
Charger			
Operating voltage	V	230 V AC	
Frequency	Hz	50-60	
Power consumption	A	0,6	
Charging current	A	5	
Accu			
Voltage	V	12 V DC	
Capacity	Ah	24	
Charging time when battery completely empty	h	5	
Connecting cable, length	m	1,2	
Weight	kg	85	62
Dimensions LxWxH	mm	1000 x 800 x 1080	780 x 550 x 1080
Hose length	m	4	2
Nominal width hose	mm	19	13,5

Tab. 6-1: Technical data

7. Assembly

The mobiSERVE is supplied with assembly included.

Depending on the version, the attachments can or must be fitted.

NOTE

During assembly, pay attention to cleanliness and to an exact connection and precise sealing.

WARNING

- Before connecting the unit to the power supply system, the correct insulation of the power cord must be checked.

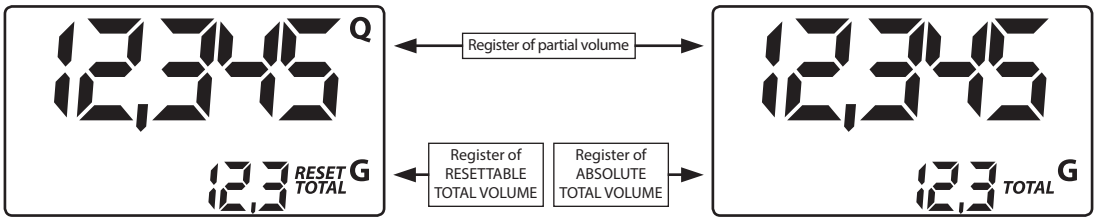
8. Daily use

The mobiSERVE is supplied ready for use.

The trolley is immediately ready for use, even after long periods of storage.

The only operation required for daily use is to reset the registers of the partial and/or resettable total amount to zero.

Then, the two screens for normal operation are called up. The first screen indicates the partial amount and the resettable total amount RESET TOTAL. The other screen shows the partial amount and the absolute total amount TOTAL. The transition from the resettable total amount to the absolute quantity is done automatically and is performed within a period of time defined during manufacturing. It cannot be changed by the user.



The register of the absolute total amount TOTAL cannot be reset to zero by the user. It will continuously increase over its whole lifetime. The registers of the two total amounts RESET TOTAL and TOTAL take the same space and the same digits on the display. This is the reason why the two total amounts will never appear together, but are always shown alternately.

The mobiSERVE is programmed in a way that the one or the other total amount is displayed at certain moments:

- The absolute total amount TOTAL is shown in the standby mode of the counter.
- The resettable total amount RESET TOTAL is displayed at the following moments:
  - For a short time (some seconds) after the partial amount has been reset to zero.
  - During discharge of fluid.

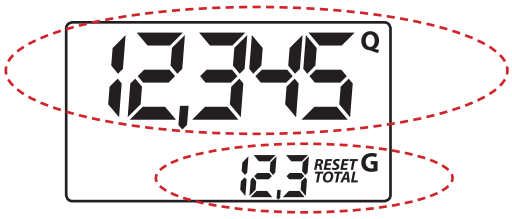
Some seconds after fluid discharge, this short time time span has elapsed and the counter changes to the standby mode. The display of the lower register shows the absolute total amount.

NOTE

6 digits are available to indicate the total amounts, plus two icons x10/x100.
The increase is done with the following sequence:
0,0 ---> 99999,9 ---> 999999 ---> 100000 x10 --->
999999 x10 ---> 100000 x100 ---> 999999 x100.

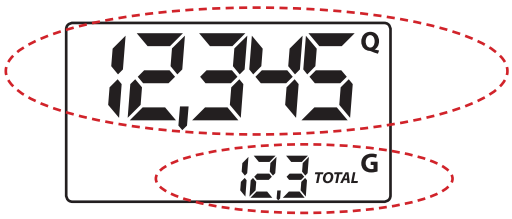
8.1 Discharge in normal mode

During standard discharge, the counter simultaneously displays the partial amount issued and the resettable total amount RESET TOTAL.



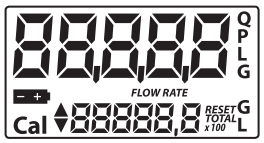
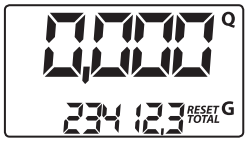
An unintended pressing of the RESET or TOTAL key during counting has no effect.

Some seconds after fluid discharge, the display of the lower register changes from the **resettable total amount** to the **absolute total amount**: The message **RESET** over the word **TOTAL** goes out and the value of the **resettable total amount** is replaced by the **absolute total amount**.



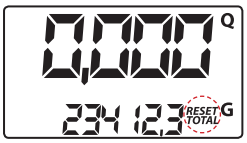
This state is called pause (or standby) and remains unchanged as long as the user does not carry out any operations at the counter.

8.1.1 Resetting the partial amount

The register of the partial amount can be reset to zero by pressing the RESET key, when the counter is in the standby mode, i. e. when TOTAL is shown in the display.	
After pressing the RESET key, i. e. when zero reset is executed, the display shows successively all digits switched on and off.	
Following this operation, at first the partial amount reset to zero and then RESET TOTAL is indicated.	
And after a few seconds, RESET TOTAL is replaced by TOTAL, the total amount NOT resettable.	

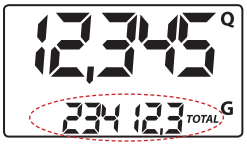
8.1.2 Resetting the resettable total amount RESET TOTAL

The resettable total amount can only be reset to zero after previously having reset the partial amount register to zero. The total amount is reset by pressing on the RESET key for a longer time, while the message RESET TOTAL is shown on the display, as on the following screen:

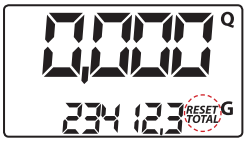


The following steps are to be carried out schematically:

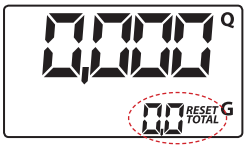
- Wait until the normal standby screen appears (only the total amount TOTAL is displayed).
- Press shortly the RESET key. After this operation, the partial amount reset to zero and RESET TOTAL are shown at first.



- The counter begins the resetting operation of the partial amount.
- While RESET TOTAL is shown on the display, press the RESET key once again for at least one second.



- The display will show all segments again, then comes the phase, during which all segments are switched off, followed by the display of the reset total amount RESET TOTAL.



8.1.3 Discharge with display of the current flow rate (Flow Rate Mode)

During discharge operations, the following displays may simultaneously appear:

- Partial amounts discharged

- Current flow rate in (measuring unit of the partial amount/min) as shown in the following.

Procedure to get into this mode:

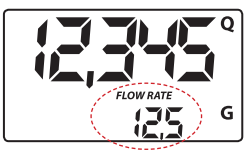
- Wait until the counter is in the standby mode, i.e. until the display only shows the total amount.
- Shortly press on the TOTAL key.
- Discharge begins.

The current flow rate is updated every 0.7 seconds. For this reason, the display may be relatively unstable for low flow rates. The higher the flow rate, the higher the stability of the value indicated.



NOTE

The flow rate is measured in the measuring unit of the partial amount. If, as in the following example, the partial amount and the total amount have different measuring units, note that the flow rate shown is indicated in the measuring unit of the partial amount. In the example below, the flow rate is indicated in QTS./Min.



The message GAL next to the flow rate refers to the register of the (resettable or NOT resettable) total amount, which is shown again, when the display mode of the flow rate is left again.

In order to return to the normal mode, press the TOTAL key once again.

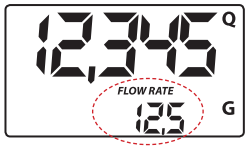
An unintended pressing of the RESET or TOTAL key has no effect during counting.

NOTE

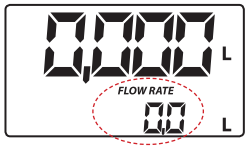
Even though the resettable (RESET TOTAL) and the absoute (TOTAL) amounts are not shown, the values nevertheless increase. These values, however, can be checked after the discharge, when the TOTAL key is shortly pressed in the "normal mode".

8.1.4 Resetting the partial amount

In order to reset the partial amount register to zero, finish discharge and wait until the counter indicates a flow rate of 0,0 (refer to illustration) and then shortly press the RESET key.



In contrast to resetting in the normal mode, the counter will, in this case, not go through the phase during which all display segments are successively switched on and off, but will immediately show the register of the partial amount reset to zero.



9. Calibration

9.1 Definition

Calibration factor or "K FACTOR":
This is the multiplication factor the system allocates to the electric impulses received in order to convert them into the unit of the measured fluid.

- FACTORY K FACTOR: Default calibration factor preset during fabrication. It is set to 1000.

The preset calibration factor can be reloaded by means of a simple procedure if the user has made changes.

- USER K FACTOR: calibration factor which has been adapted to the user's requirements, i. e. which has been changed by a calibration.

9.2 Why to calibrate?

The mobiSERVE is delivered with a setting made by the manufacturer. In most operating conditions, this setting will ensure a precise measurement.

Nevertheless, a calibration made under operating conditions may be advisable, e. g. if the counter is operated under extreme conditions.

9.3 Calibration mode

The mobiSERVE offers the possibility to carry out a quick and precise electronic calibration by changing the calibration factor (K FACTOR).

Two procedures are possible to calibrate the unit:
- Calibration during simulated operation, when fluid is discharged.
- Direct calibration, whereby the calibration factor is changed.

When the TOTAL key is pressed for a longer time, the user gets access to the calibration process:
- Display of the calibration factor currently being used.
- Resetting the calibration factor of the manufacturer (FACTORY K FACTOR) after a calibration by the user.
- Change of the calibration factor by means of one of the procedures mentioned above.

In the different phases of the calibration mode, the meanings of the messages on the display vary regarding the partial and total amount issued.

In the calibrating mode, the counter cannot show normal data.

NOTE

The mobiSERVE is equipped with a non-volatile memory ensuring that the saved calibration and total discharge amount data are retained even without power supply. After the battery has been replaced, a new calibration is not necessary.

9.4 Display of the current calibration factor and, if required, resetting the manufacturer's factor

When the TOTAL key is pressed in the standby mode, the calibration factor currently being used is indicated.

Two cases may occur:

a) If a calibration has never been carried out yet, or if the manufacturer's value has been set after a calibration, the following display will appear:

The message FACT (abbreviation for FACTORY) indicates that the calibration factor of the manufacturer is used.



b) If calibrations have been effected by the user, the calibration value currently being used is shown (0.998 in our example).

The message USER appears on the screen to indicate that the calibration factor used has been entered by the user.

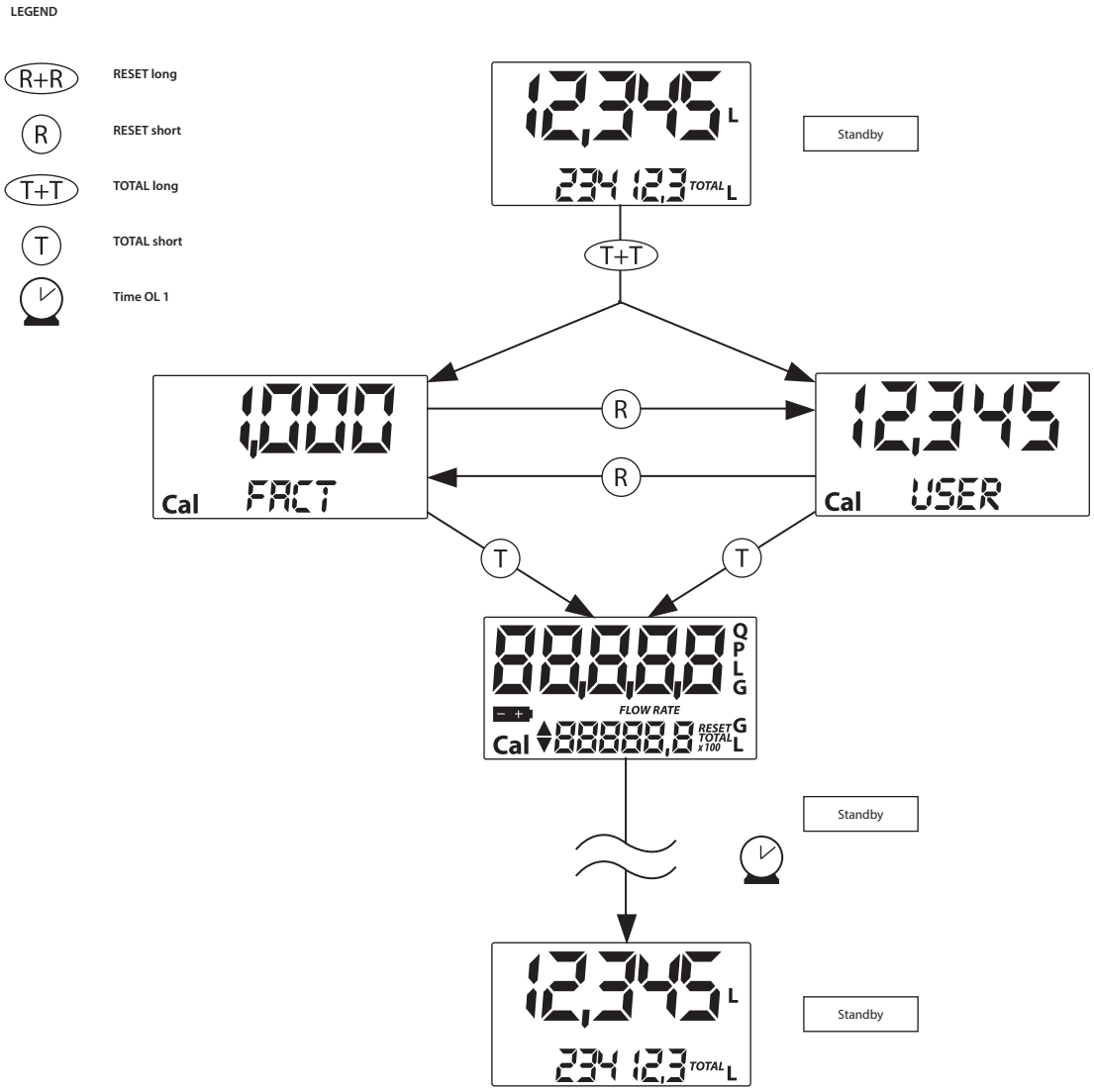


The flow chart opposite informs on the logical relationships between the various screens.

In this mode, the RESET key allows to change from the USER to the FACTORY FACTOR.

To confirm the calibration factor selection, shortly press the TOTAL key while USER or FACT is displayed.

After restart, the counter will use the calibration factor just confirmed.



NOTE

At the moment when the factor of the manufacturer is confirmed, the previous user factor is deleted from the memory.

9.4.1 Calibration during operation

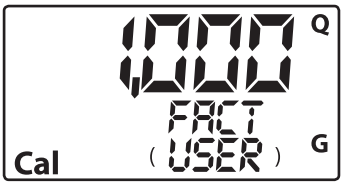
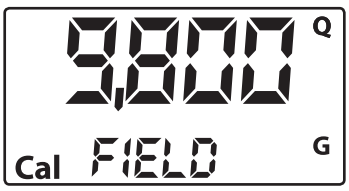
During this procedure, a fluid is delivered in a measuring container under realistic operation conditions (flow rate, viscosity), which must be strictly adhered to.

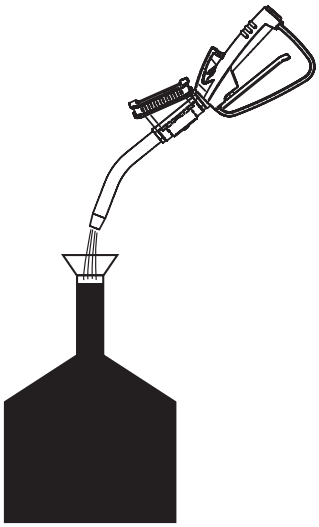
The following points must be observed for a correct calibration of the counter:

- Completely bleed the air from the system before the calibration is carried out.
- Use a calibrated container which has a capacity of at least 5 liters and features exact measuring marks.
- For calibration, carry out the discharge procedure at a constant flow rate corresponding to the rate issued during normal operation. Fill the container until it is full.

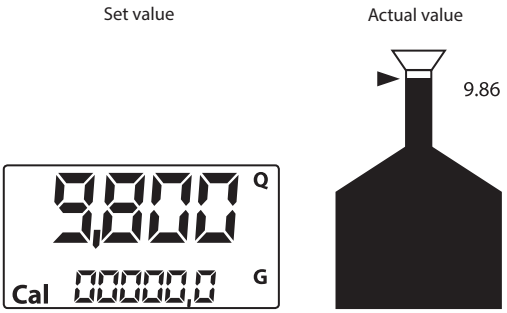
- Do not reduce the flow rate when the measuring scale of the container is almost reached during the final period of discharge. At the end of the filling operation, the right procedure is to carry out short refilling cycles at the normal operating flow rate.
- After the discharge operation, wait a few minutes in order to ensure that all air bubbles have been removed from the container. The correct value can be read only upon completion of this phase, because at an earlier stage, the level may still drop in the container.
- Carry out the procedure correctly as described in the folowing.

9.4.2 Calibration procedure during operation

	Operation	Display-Configuration
1	NONE Counter in normal mode, not counting	
2	LONG PRESS ON THE TOTAL KEY The mobiSERVE enters into the calibration mode, shows the message TOTAL and the calibration factor used instead of the total amount. The messages FACT and USER indicate which one of the two factors (manufacturer or user) is currently being used.	
3	LONG PRESS ON THE RESET KEY The mobiSERVE indicates the TOTAL screen and the resettable total amount indicator is zero. The counter is ready to carry out a calibration during operation.	
4	DISCHARGE IN THE CALIBRATED CONTAINER Start the dispense in the calibrated container without pressing a key.	

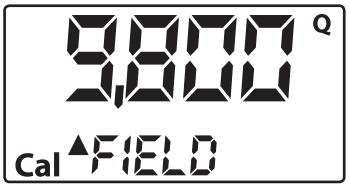


The discharge procedure can be interrupted and started at any time. Carry out the discharge until the fluid has achieved the measuring scale of the calibrated container. It is not necessary to achieve a certain amount.



5

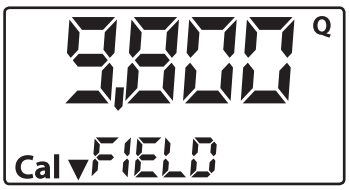
SHORT PRESS ON THE RESET KEY



The mobiSERVE is informed that the calibration discharge is finished. Check to ensure that the discharge is completely finished before this happens.

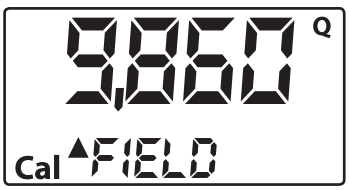
To calibrate the mobiSERVE, the value indicated by the partial amount counter (example 9.800) must be brought to the actual value indicated by the calibrated container. On the lower left corner of the display, an arrow appears, pointing upwards or downwards, thus indicating the direction in which the USER K FACTOR value is changed. Increase or reduce when the operations 6 or 7 are carried out.

6 SHORT PRESS ON THE RESET KEY



Change of arrow direction. This procedure can be repeated as often as required.

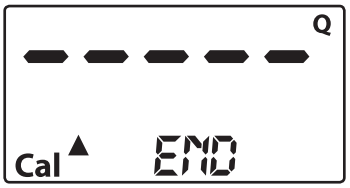
7 SHORT/LONG PRESS ON THE TOTAL KEY



The value indicated is changed in the direction defined by the arrow:

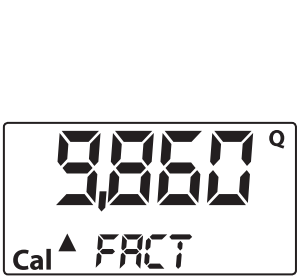
- One unit for each short press on the TOTAL key
- Continuously, when the TOTAL key is kept depressed - the first 5 units change slowly, then quickly.
- If the value desired is exceeded, repeat the operation from point 6 (6).

8 LONG PRESS ON THE RESET KEY



The mobiSERVE is informed that the calibration procedure is finished.

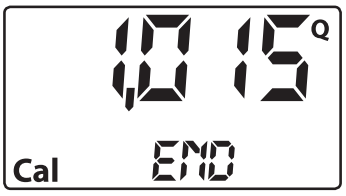
Before this operation is carried out, check to ensure that the STANDARD VALUE corresponds to the ACTUAL VALUE.



The mobiSERVE calculates the new USER K FACTOR. This calculation may take some seconds, according to the correction to be made. During this procedure, the arrow disappears, but TOTAL remains on the screen.

If this procedure is carried out after point 5 without changing the value indicated, the USER K FACTOR is equal to the FACTORY K FACTOR and is thus ignored.

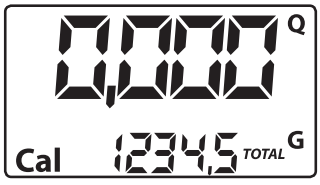
9 NO OPERATION



After the calculation, the new USER K FACTOR is indicated for some seconds, then, the restart procedure is repeated in order to finally get into the standby mode.

ATTENTION: From that moment, the value indicated is the new calibration factor used by the counter, and it remains so, also after a battery replacement!

10 NO OPERATION



The mobiSERVE stores the new operating calibration factor and is prepared for discharge with the USER K FACTOR just calculated.

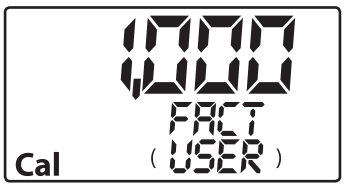
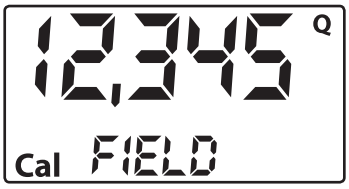
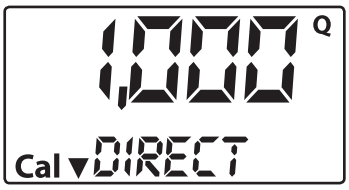
9.4.3 Direct change of the K FACTOR

This procedure is especially helpful in order to correct an average error, which may occur because of the multitude of tasks carried out. If, during normal counter operation, an average percent error occurs, this one may be corrected by altering the calibration factor currently being used by the same percent value. In this case, the percentage of the correction of the USER K FACTOR can be calculated by the user as follows:

$$\textbf{new calibration factor} = \textbf{old calibration factor} \times \frac{\textbf{100-E\%}}{\textbf{100}}$$

Example:	
Percent error occurred E %	-0,9 %
Current calibration factor	1.000
New USER K FACTOR	1.000 x {[100-(-0,9)]÷100}= 1.000 x [(100+0,9)÷100]= 1.009

If the counter indicates less than the real discharge value (negative error), the new calibration factor must be higher than the previous one, as the example shows. Vice versa, if the counter indicates more than the real discharge value (positive error).

	Operation	**Display Configuration**
1	NONE Counter in normal mode, not counting	
2	LONG PRESS ON THE TOTAL KEY The counter enters into the calibration mode and the calibration factor used is displayed instead of the partial amount. The messages FACT or USER on the screen indicate which one of the two factors is currently being used (user or manufacturer).	
3	LONG PRESS ON THE RESET KEY The counter indicates the TOTAL screen and the resettable total amount indicator is zero. The counter is ready to carry out the calibration by discharge.	
4	LONG PRESS ON THE RESET KEY Direct change of the calibration factor. The message DIRECT and the calibration factor currently being used appear on the display. On the lower left corner of the screen, an arrow is shown, indicating the direction in which the value displayed is changed. Increase or reduce when the operations 5 or 6 are carried out.	
5	SHORT PRESS ON THE RESET KEY Change of arrow direction. The operation can be repeated in order to change the arrow direction.	

6 SHORT/LONG PRESS ON THE RESET KEY

The value indicated is changed in the direction defined by the arrow.

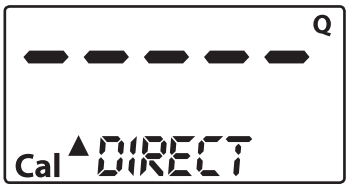
- One unit for each short press on the TOTAL key.
- Continuously, when the TOTAL key is kept depressed. The speed with which the value is increased raises when the key is held down.

If the required value is exceeded, repeat the procedure from point 5.



7 LONG PRESS ON THE RESET KEY

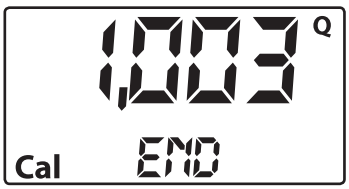
The mobiSERVE is informed that the calibration procedure is finished.
Before executing this operation, make sure that the indicated value corresponds to the desired vale.



8 NO OPERATION

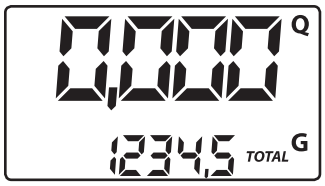
After the calculation, the new USER K FACTOR is indicated for some seconds, then, the restart procedure is repeated in order to finally get into the standby mode.

ATTENTION: From that moment, the value indicated is the new calibration factor used by the counter, and it remains so also after a battery replacement.



9 NO OPERATION

The mobiSERVE stores the new operating calibration factor and is ready for discharge with the USER K FACTOR just calculated.



10. Configuration of the mobiSERVE counter

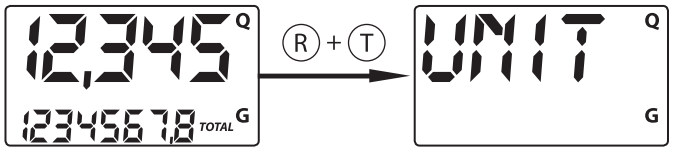
The counter features a menu allowing the user to choose the main measuring unit: quarters (QTS), Pints (PTS), Liters (L), Gallons (GAL).

The combination of the measuring units of the partial amount and total amount registers is defined in the following table:

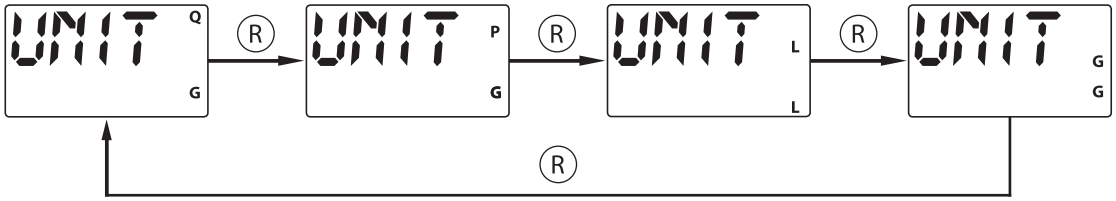
Combination No.	Measuring unit Partial amount register	Measuring unit Total amount register
1	Liters (L)	Liters (L)
2	Gallons (GAL)	Gallons (GAL)
3	Quarts (QTS)	Gallons (GAL)
4	Pints (PTS)	Gallons (GAL)

To choose one of the four combinations proposed:

Wait until the mobiSERVE is in the standby mode, then simultaneously press the TOTAL and RESET keys until the message UNIT and the measuring unit defined at this moment appear on the display (in our example Liters/Liters).



When the RESET key is shortly pressed, the various combinations of the measuring units are called up one after the other, as it is shown below:



When pressing the TOTAL key for a longer time, the new settings are stored and, after the start-up process, the counter is ready to run with the new measuring units.

NOTE

The registers of the resettable and absolute total amounts are automatically converted into the new measuring units.

Changing the measuring unit **DOES NOT** require a new calibration.

11. Preventive maintenance

The mobiSERVE has been designed in such a way that no maintenance is required.

12. Troubleshooting

Failure	Cause	Solution
LCD: no display	▸ Loose contact of the batteries	▸ Check the battery contacts
Insufficient measuring accuracy	▸ Incorrect K FACTOR	▸ Check the K FACTOR, refer to paragraph 9.3
	▸ The counter runs below the minimum admissible flow rate	▸ Increase the flow rate until an acceptable flow rate is reached
Display Err 1 flashes	▸ The data in the electric card memory are damaged	▸ Irreparabel
Short display of Err 2	▸ Short-term data read error (for the most part when replacing the battery)	▸ The card switches off and on automatically, in order to return to correct operation

13. Maintenance

CAUTION

- Prior to maintenance work on the electric system of the mobiSERVE, disconnect the unit from the voltage source by means of the battery cut-off switch.
- Wear protective gloves when performing maintenance work on the electric system.
- For all maintenance and service work, the mains plug for charging the battery must be disconnected from the device.
- Maintenance work on the electric system may be only done by authorized and qualified personnel.

WARNING

Risk of injury when removing the lead-acid battery.

- The battery may only be removed from the mobiSERVE by a sufficiently trained and instructed personnel.
- Keep to the battery manufacturer's instructions when transporting the battery!

14. Cleaning the nozzle holder

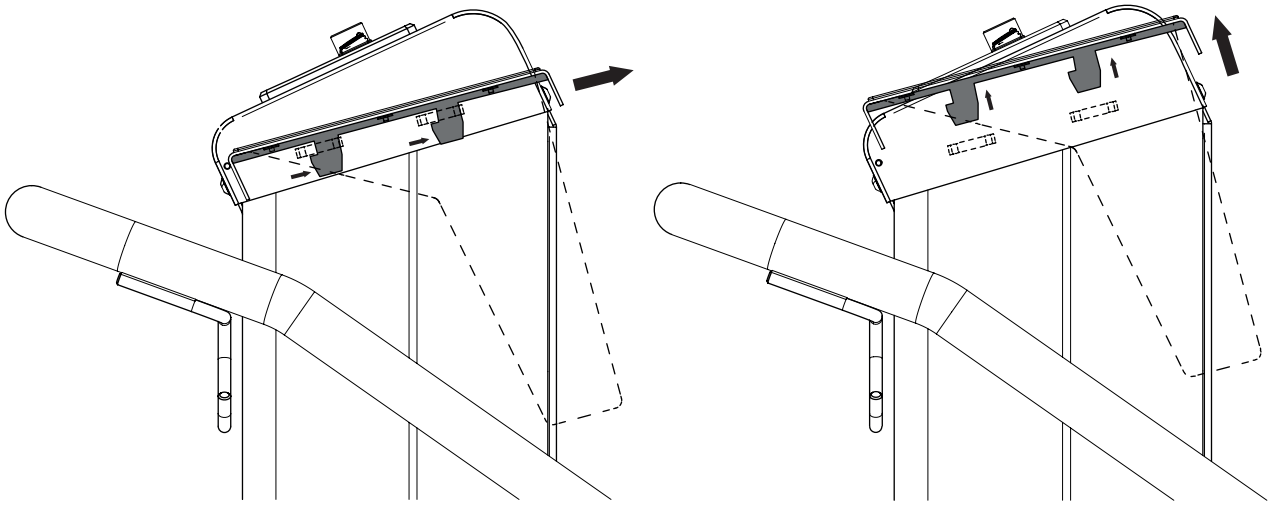


Fig. 14-1: Dismantling the nozzle holder from the panel

From time to time, the nozzle holder can be cleaned from urea crystal sediments.

To do this, slightly move the nozzle holder to the right to loosen it from the panel and then pull it off upwards (refer to fig. 14-1). Rinse it with warm water and attach it in reverse order.

15. Repair/Service

The mobiSERVE was 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 17-216

Fax +49 9462 1063

service@fmtag.ch

16. Disposal

The operating company is responsible for the proper disposal of the mobiSERVE.
Hereby, the industry-specific and local regulations must be observed when disposing of the different materials.

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



WARNING

For removing the lead-acid battery from the housing, the following steps must be carried out successively:

- Disconnect the battery from the electric components by means of the battery cut-off switch.
- Disconnect the black terminal from the negative pole of the battery and remove it.
- Put the black protective cap on the negative pole of the battery.
- Disconnect the red terminal from the positive pole of the battery and remove it.
- Put the red protective cap on the positive pole of the battery.
- Loosen the battery mount and take the battery out of the housing.

17. Exploded view of mobiSERVE 200 l

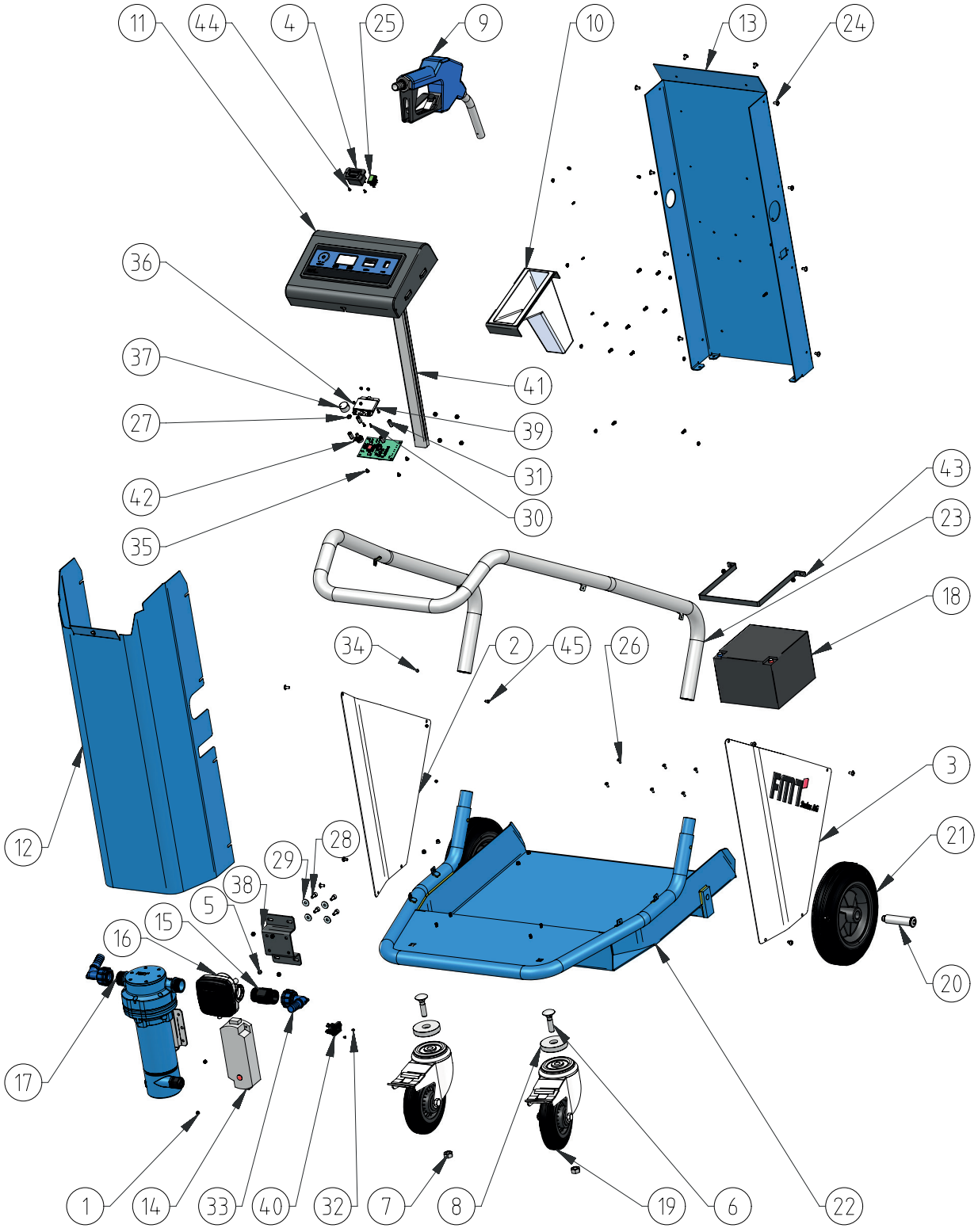


Fig. 17-1: Exploded view of mobiSERVE 200 l

Pos.	Quantity	Description
1	2	Nut DIN 985
2	1	Reinforcing plate L. H.
3	1	Reinforcing plate R. H.
4	1	Charge indicator 12 V
5	14	Nut DIN 985
6	2	Cup square bolt M12x50
7	2	Nut DIN 934
8	2	Spacer
9	1	Automatic nozzle valve - urea - stainless steel
10	1	Nozzle holder - white
11	1	Control panel assy.
12	1	Covering assy.
13	1	Supporting plate assy.
14	1	Automatic charger
15	1	Double nipple, urea
16	1	Pulse meter - G 1" fem-G 1" fem-urea, oval gear meter - stainless steel
17	1	Urea electric diaphragm pump 30 l/min-7,9 gpm-12 V-DC
18	1	AGM lead accumulator
19	2	Castor with total lock
20	2	Shaft
21	2	Solid rubber tyre
22	1	Trolley frame
23	1	Handle, upper part, assy.
24	19	Screws with flattened half round head and collar M5x10
25	1	Rocker switch, green
26	6	Countersunk screw M 4x12
27	1	Counternut for potentiometer
28	4	Cylinder screw M 6x12
29	4	Shim DIN 9021
30	4	Fillister head screw M 3x8
31	4	Spacer
32	2	Fillister head screw M 3x5
33	2	Bend 90° with fitting - urea
34	3	Hexagon nut DIN985
35	4	Fillister head screw M 4x6
36	4	Washer
37	1	Rotary knob with pointer
38	1	Support bracket, height 28.5 mm for NUMERIxx
39	1	Board NUMERIxx digital
40	1	Plug C14
41	1	Cable duct 18x30x400
42	1	Control unit mobiSERVE
43	1	Fastening clip
44	2	Fillister head screw M 3x6
45	1	Cylinder screw M 4x6

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

18. Exploded view of mobiSERVE 60 l

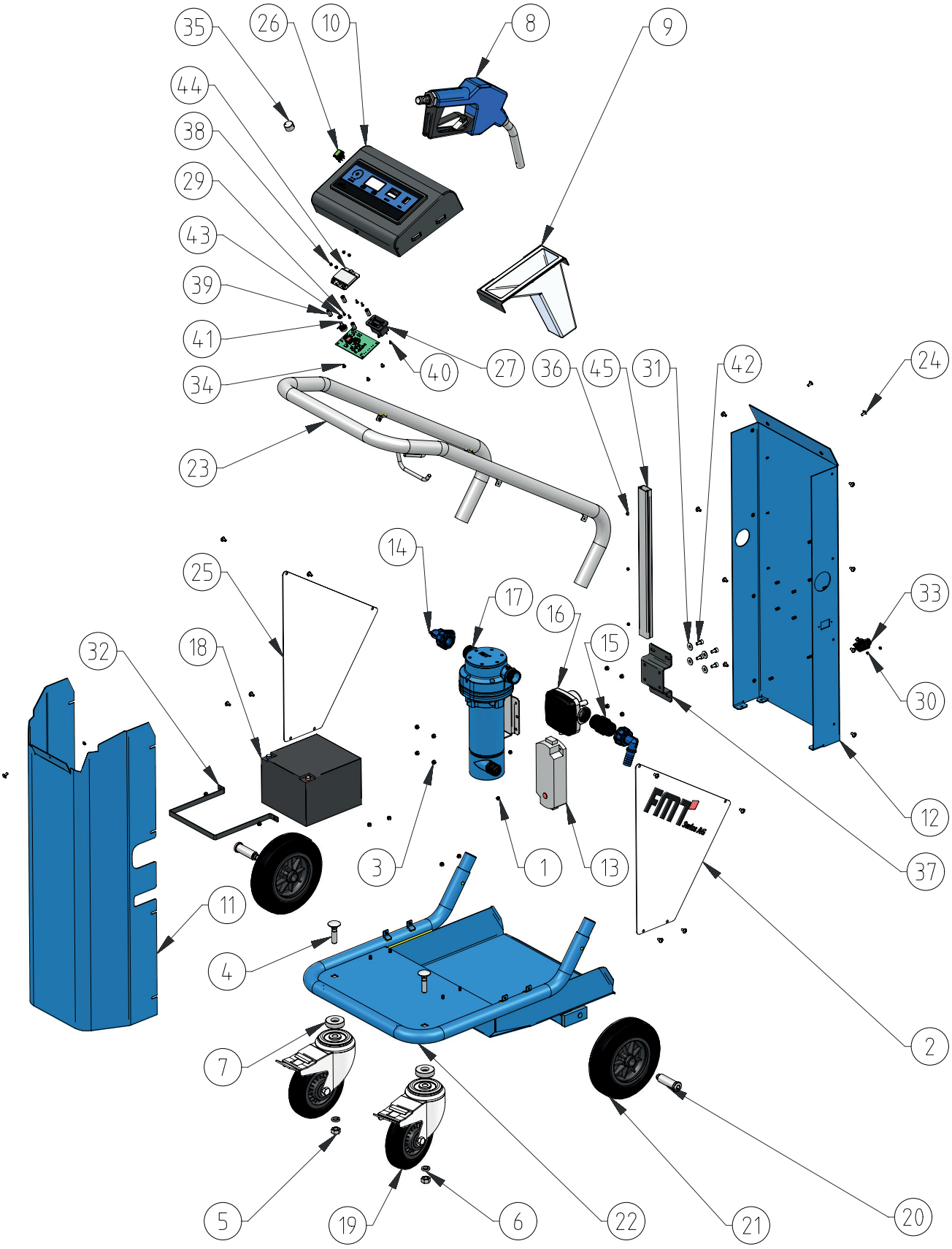
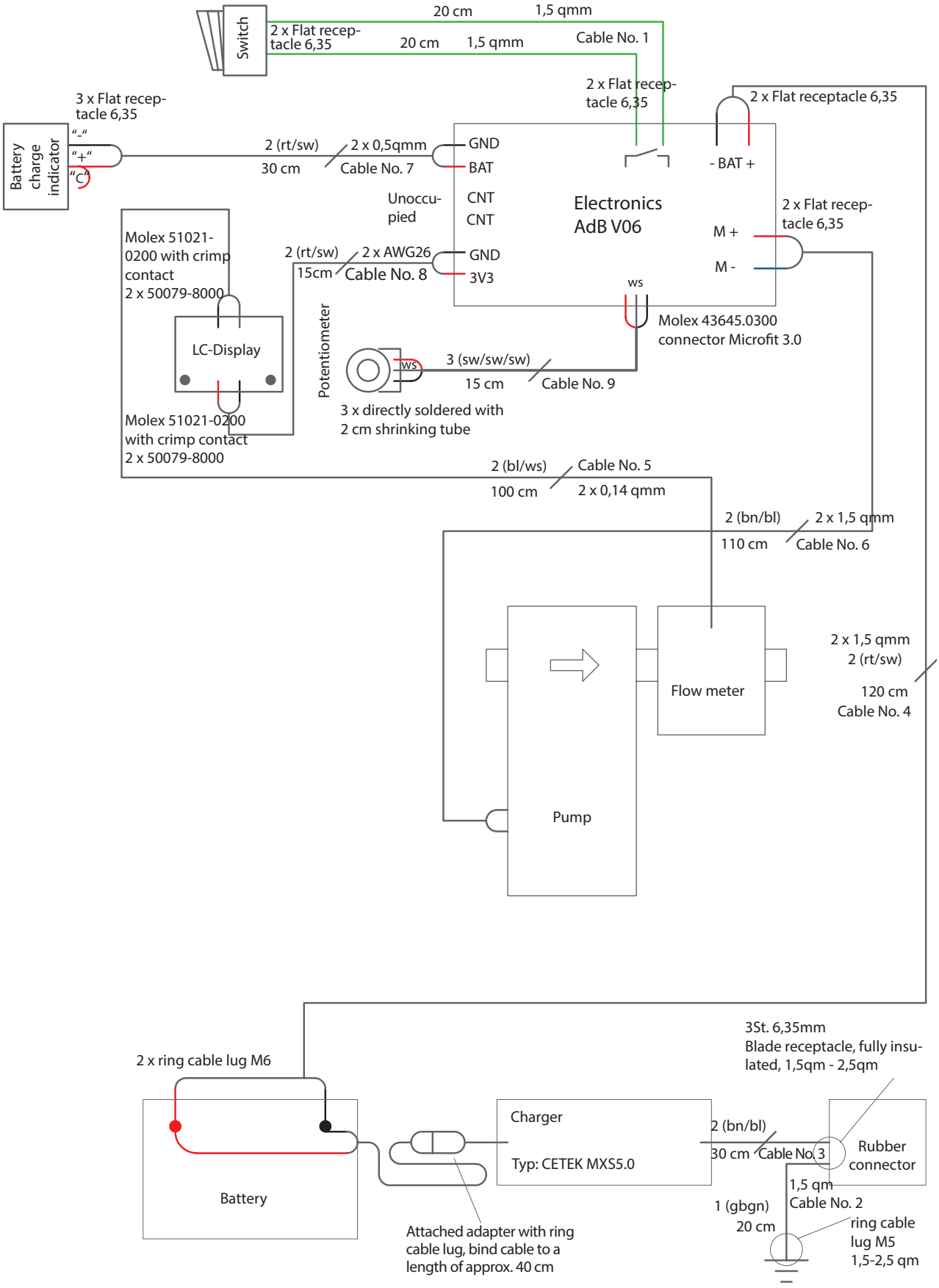


Fig. 18-1: Exploded view of mobiSERVE 60 l

Pos.	Quantity	Description
1	2	Nut DIN 985
2	1	Reinforcing plate R. H.
3	14	Nut DIN 985
4	2	Cup square bolt M12x50
5	2	Nut DIN 934
6	2	Spring washer Ø12-3,5
7	2	Spacer
8	1	Automatic nozzle valve - urea
9	1	Nozzle holder - white
10	1	Control panel assy.
11	1	Covering assy.
12	1	Supporting plate assy.
13	1	Automatic charger
14	2	Bend 90° with fitting - urea
15	1	Double nipple, urea
16	1	Pulse meter - G 1" i-G 1" i-urea, oval gear meter - stainless steel
17	1	Urea electric diaphragm pump 30 l/min-7,9 gpm-12 V-DC
18	1	AGM lead accumulator
19	2	Castor with total lock
20	2	Shaft
21	2	Solid rubber tyre
22	1	Trolley frame
23	1	Handle, upper part, assy.
24	19	Screws with flattened half round head and collar M5x10
25	1	Reinforcing plate L. H.
26	1	Rocker switch, green
27	1	Charge indicator 12 V
28	6	Countersunk screw M 4x16
29	4	Fillister head screw M 3x8
30	2	Fillister head screw M 3x5
31	4	Shim DIN 9021
32	1	Fastening clip
33	1	Plug C14
34	4	Fillister head screw M 4x6
35	1	Rotary knob with pointer
36	3	Hexagon nut DIN985
37	1	Support bracket, height 28.5mm for NUMERIxx
38	4	Washer
39	4	Spacer
40	2	Fillister head screw M 3x6
41	1	Control unit mobiSERVE
42	4	Cylinder screw M 6x12
43	1	Counternut for potentiometer
44	1	Board NUMERIxx digital
45	1	Cable duct 18x30x400

Tab. 18-1: Overview of components for fig. 18-1

19. Wiring diagram mobiSERVE



FMT Swiss AG

20. 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	**mobiSERVE 60 l - 25353; 25353 836** **mobiSERVE 200 l - 25352; 25352 836**
Motor voltage	12 V
Weight	mobiSERVE 60 l - 62 kg mobiSERVE 200 l - 85 kg
Function	Conveying of urea (AdBlue®) or water

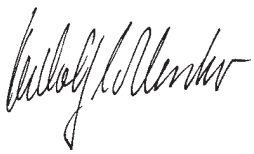
Complies with all relevant provisions of the following directives:	
EC Directives	2006/42/EC Machinery Directive 2014/30/EC EMC Directive 2011/65/EC EC Directive (RoHS)
Applicable standards	EN 809:1998+A1:2009 + AC:2010 EN ISO 4413:2011-04 EN 60204-1:2006 EN ISO 12100:2010 EN 55011:2009 + A1:2010 EN 61000-2-4:2002

Authorized representative for the compilation of the technical documentation:

Name: Maria Gross
Address: Fluid Management Technologies Swiss AG
Gewerbestraße 6
6330 Cham / Schweiz
Phone: +49 (0) 9462/ 17 -218

FMT Swiss AG

Cham, 23.02.2018



Dipl.-Ing. Rudolf Schlenker

(Managing Director)

FMT Swiss AG
Fluid Management Technologies Swiss AG
Gewerbestraße 6
6330 Cham / Schweiz
Tel. +41 41 712 05 37
Fax +41 41 720 26 21
info@fmtag.com
www.fmtag.com

FMT Swiss AG