

Operating Instruction Digital Grease Meter

Art.no. 18115



FMT Swiss AG

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1. General details

1.1 History of documents

Date	Name	Version	Modification
24.04.2009	TK	1.00	Creation
10.06.2009	TK	1.01.	Re-designed after completion
19.02.2009	KN	1.02	Revise of programming
15.04.2010	TK	1.03	Extended manual K-factor calibration, time-controlled reset to TOTAL

1.2 Intended operation

- The grease meter has been developed and constructed for accurate measurement and registration of volumes of various greases.
- The grease meter is designed for the use with manual grease guns and grease supply systems.

1.3 Construction and description of operation

- The grease meter is designed as an oval-gear meter with an integral electronic counting mechanism and a digital display.
- The flow of grease rotates the oval gear-wheels transferring utilising a Reed-switch the impulses to the electronic counting mechanism. The impulses will be converted based on a pre-set factor into the effective volume and indicated on the display.
- The factor is pre-set by the manufacturer on an average volume which can be individually adjusted to a user oriented calibration by use of a key combination.
- The total volume will be registered as well and can be controlled pressing the pushbutton (TOTAL).
- For the operation use two membrane-keybuttons only. Reset and TOTAL.

1.4 Technical details

Description

Connection 1	G 1/8 " female
Connection 2	G 1/8 " female
Designed for	use with greases NLGI 1-2
Units	Calibratable in litres or cm ³
Performance	0-1000 cm ³ /min
Max. operating pressure (bar)	700
Burst pressure (bar)	1000
Temperature range (°C)	-20/+60
Material of housing	Aluminium
Repeat accuracy	0-300 bar ±1%
Display	partial volumes and totalisator
Height of digits	13 mm
Power supply (V)	2,3 – 3,3
Power consumption (A)	max. 800 µA
Batteries	2 pcs.
Type of batteries	1,5V Lady LR1
Life time of battery	approx. 2 years
5-digits	display, partial volume and totalisator, resettable
Dimensions	LxWxH (mm) 85x73x57
Weight (kg)	0,3


2. General safety advises

2.1 Advises for the safety at work


- The grease meter has been designed and manufactured with respect to the general safety and health requirements of the relevant EU directives.
- However this product might be dangerous if it is not operated according to the intentions of the product or with the required care.
- The grease meter should be operated according to the local safety regulation and rules for accident prevention of this operating instruction in any case.

2.2 Explanation of the safety advises

The safety advise in this operating instruction indicates following grade of danger. This grade of danger is indicated with following signal word and pictogram.

Pictogram	Signal word	Consequences, in case safety instructions will not be observed
	Attention	Potential light or medium personal injuries or damages

Moreover an additional advise offering general recommendations for the operation of the product can be utilized.

Pictogram	Signal word	Meaning
	Advice	Background knowledge or advises for the correct use of the product.

2.3 Safety advises for the correct handling of the grease meter



Attention!

- The grease meter is designed to be used with flame resistant greases only.
- Do not use the grease meter in explosive ambience.



Advice

Please make sure that any grease supply system utilizing the grease meter is assembled and operated according to local regulation.
For maintenance and operation please refer to local regulation.

3. Mounting

- The grease meter will be supplied completely assembled.
- Depending on the version supplied accessories must be mounted possibly.



Advice

Look out for a clean mounting and pay attention to a careful and exact thread connection and sealing.

4. Installation

The grease meter shows a straight inlet and outlet with G 1/8" female thread connection on both sides. The grease meter can be installed in any position, as part of a fixed in-line installation or as a mobile installation connected to a grease gun.

The grease meter is preset to a fixed flow direction. Both connections can be utilized as inlet or as outlet.

5. Daily use

5.1 Measuring details

A change of the measurement units is not provided. The measurement will be effected based on a special relation of impulses to the displayed volume. Based on this the displayed volume will be shown accordingly. This is an unchangeable part of the firmware and defines the measuring unit. Volume units will be measured. It makes sense therefore to define the units in cm³ or litres. Units in KG are optional requiring a constant density of the grease to be measured. The release is (a decimal point will be preset):

- Partial volume: Display 0000,0 cm³, this means 0,1g or 0,1 cm³.
- Exceeding of 9999,9 cm³ the release will change to 1 cm³
- Total: Display 00,000 TON (1000 l), this means 0,001 – 1 l or 1000 cm³
- When exceeding the measurement totals the decimal point will be adjusted accordingly.

The display symbol "L" stands for "TON" or 1000 l, "l" for gramme or cm³

5.2 Operation /Function

See the description of the function in the following.

Explanation of the pushbuttons:

RESET	Press the right pushbutton labelled with 'RESET' for a short time
RESET	press for a long time. Press the right pushbutton longer than 1 sec.
TOTAL	Press the left pushbutton labelled with 'TOTAL' for a short time
TOTAL	press for a long time. Press the left pushbutton longer than 1 sec.
RESET + TOTAL	simultaneous longer pressing (1 sec) of both pushbuttons.

5.3 Activating

The meter will be activated automatically when pressing any pushbutton or a measuring process starts. When activating the meter by pressing of a pushbutton the previous measuring result will not be deleted.

5.4 Switch-off

The meter automatically switches to stand-by mode after an inactivity of 10 minutes

5.5 Main display

The meter can display "partial volume" or "total volume" (TOTAL) alternatively. The pushbutton TOTAL alternates between the bothe displays "Total" and "partial volume". The symbol "TOTAL" activates automatically in the display depending on the volume requested. The pushbuttons are blocked for 3 seconds when measuring (continuous display, measuring impulses).

5.6 Total

This display shows the symbol TOTAL. The grease meter adds the total of all measurements with max. 3 decimal places. The decimal point when starting a measuring process starts with "0,000" and will be adjusted automatically depending on the volume to be measured. The displayed volume can be reset by pressing of the pushbutton RESET for long time. TOTAL short switches to the display "partial volume". RESET short switches to display "partial volume" and delets the displayed partial volume for a new measuring process.

5.7 Partial volume

In this display the symbol TOTAL is not visible. The counter "partial volume" accounts the current measurement with one decimal. The decimal point will be adjusted to the display and starts with "0,0".

The pushbutton TOTAL switches the display to TOTAL.

RESET short resets the counter partial volume back to zero to start a new measuring process. The partial volume will be displayed automatically when dispensing. 5 seconds after dispensing or after the manual switch to partial volume (using TOTAL short) the display will automatically reset to Total.

5.8 Termination by timeout / switch-off

The main display switches off after 10 minutes activating the stand-by mode automatically, if not re-activated by pressing a pushbutton or a starting measuring process.

6. Calibration

6.1 Registration of the actual value

RESET + TOTAL simultaneous longer pressing (1 sec) of both pushbuttons activates the calibration mode. The symbol "Cal" appears. The display switches to "partial quantity" resetting the display to 0,0.

A definite volume can be dispensed acting furthermore as actual value.

RESET short resets the partial volume dispensed at any time to repeat the measuring process.

RESET long terminates the calibration.

TOTAL long stores the volume dispensed. The last digit (right) starts blinking.

RESET short highlights the blinking digit or resets 9 to zero.

TOTAL short stores the value of the digit and switches to the next digit

beginning to blink going back to the last digit on the right.

TOTAL long stores the preset value as nominal value and calculates the K-factor showing it for 1 second before changing to the main display again.

6.2 Change of the preset K-factor

RESET + TOTAL simultaneous longer pressing (1 sec) of both pushbuttons activates the calibration mode. The symbol "Cal" appears. The display switches to "partial quantity" resetting the display to 0,0.

A short pressing of TOTAL shows the preset calibration factor.

RESET short highlights the blinking digit or resets 9 to zero.

TOTAL short stores the value of the digit and switches to the next left digit starting to blink. It possibly switches back to the last right digit.

TOTAL long stores the preset value as new K-factor showing it for 1 second before switching back to main display.

RESET long terminates the calibration and returns to main display..

6.3 Reset of the calibration factor to factory value (1.000)

RESET + TOTAL simultaneous longer pressing (1 sec) of both pushbuttons activates the calibration mode. The symbol "Cal" appears. The display switches to "partial quantity" resetting the display to 0,0.

Long pressing of pushbutton TOTAL starts the last (right) digit blinking.

RESET + TOTAL simultaneous longer pressing (1 sec) of both pushbuttons resets to the factory preset calibration: $K = 1.000$.

This calibration factor will be shown for 1 second. After that it switches back to the main display.

The calibration will be terminated without storing if no action takes place in 30 seconds.

7. Maintenance

The grease meter is designed for a utilization requiring low maintenance efforts, only. See the following details:

- Exchange of empty batteries.

7.1 Exchange of batteries

The meter will be supplied with two 1,5V alkaline batteries.



Attention!

Please dispose the empty batteries according to local regulation, only.

For changing of batteries proceed as follows (Reference to the position of the spare parts list):

- Remove the locking screw (pos. 17).
- Remove the empty batteries.
- Replace the old batteries by the new ones. Take care that the position of the positive pole corresponds the illustration of the explosion drawing.
- Tighten the locking screw carefully. Take care for a correct re-positioning of the O-ring (pos. 16) and of the spring (pos. 15).
- The meter re-starts automatically. The normal operation can be started again.

After the change of the batteries all data for resettable dispensed volumes, for total and for partial volumes will be displayed as before.

The meter will utilize the same calibration factor after the change of the batteries or after an electrical power blackout as before. There is no re-calibration required.

7.2 Cleaning

The metering chamber of the grease meter can be cleaned even if the meter is connected to a grease gun or installed in a grease distribution line.



Attention!

Take care every time that the meter is not pressurized prior to any cleaning process.

Die Reinigung der Kammer erfolgt folgendermaßen (Verweis auf die Position der Ersatzteilliste):

- For cleaning of the meter proceed as follows ((Reference to the position of the spare parts list):
- Remove the four screws of the lower cover (pos. 13).
- Remove the cover (pos. 12) and the O-ring (pos.10)
- Take out the oval gear wheels (pos. 9).
- Proceed with the cleaning. We recommend the use of a suitable brush or of a pointed tool, i.e. a small screw driver.
- Clean carefully so the gear wheels will not be damaged.

For the re-assembly follow the a.m. advises vice versa.



Attention!

Take care for a correct re-assembly of the gear wheels (see explosion drawing).

8. Troubleshooting

Fault	Reason	Solution
LCD: no display	Loose connection of batteries.	Check of battery contacts.
Unsufficient measuring accuracy	Incorrect K-factor	Check of K-factor see part 6.3
Unsufficient or no dispensing volume	Blocked gear wheels	Clening of measuring chamber
The meter does not account — the dispensing volume is normal.	Incorrect installation of gear wheels after cleaning	Repeat of the re-installation steps
	Possible problems with the electronic card.	Contact your dealer

9. Repair/service

The grease meter has been designed and manufactured with respect to the highest quality standards.

Should a quality problem appear despite of all quality precautions please contact our customer's service.

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10. Manufacturers declaration

We herewith declare, that the product described in the following has been designed in the manufactured version according to general regulation. If the product is not used according to its intention this declaration will automatically loose its validity.

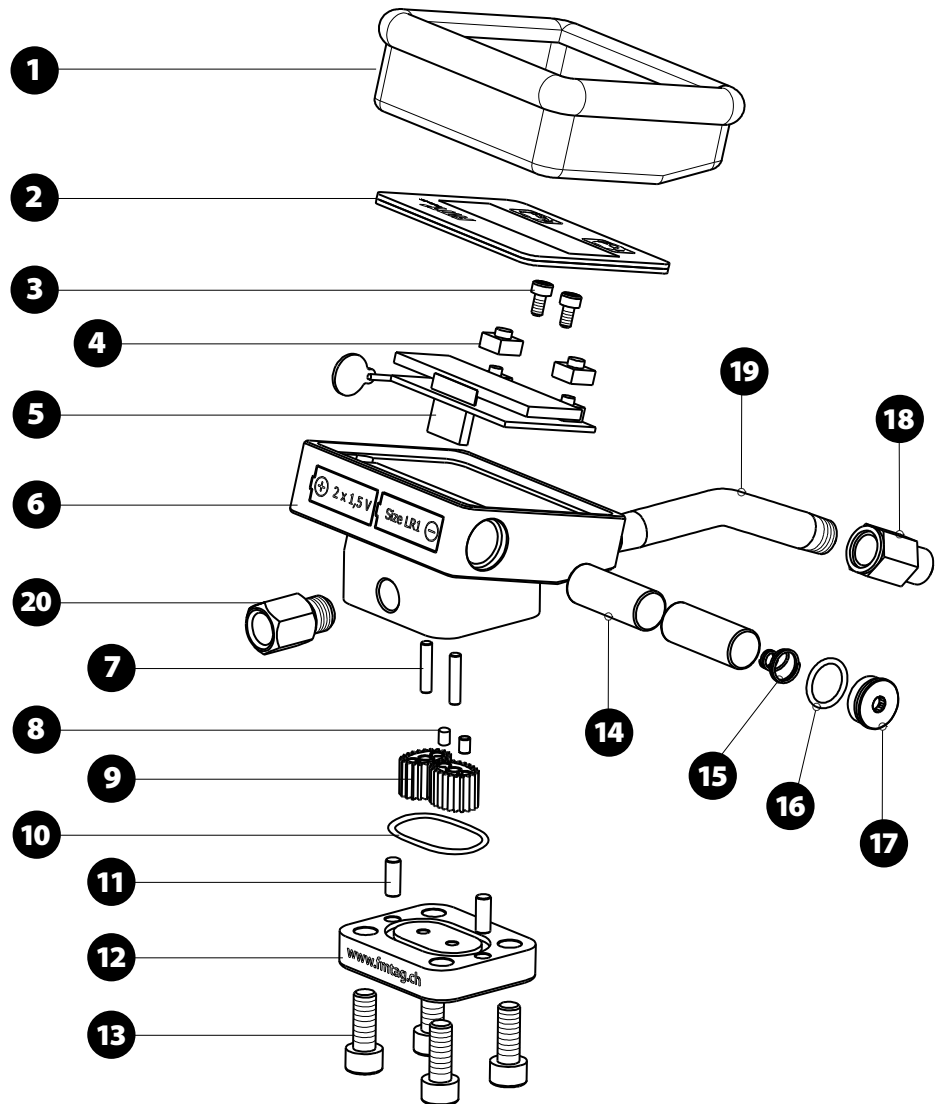
Product	Oval gear wheel meter
In accordance with the regulation:	89/336/EWG (electromagnetic compatibility) and the following adjustments
Relating European regulation	EN 61000-6-1 EN 61000-6-3 EN 55014-1-2000 EN 55014-2-97

26.05.2010

FMT Swiss AG


Dipl.-Ing. Rudolf Schlenker

11. Explosion drawing



12. Parts list

Nr.	Quantity	Description	Art. No.
1	1	Rubber protection	84 548
2	1	Display protection	82 305
3	2	Lens head screw M3x6	85 572
4	2	Buttons	85 600
5	1	Blank	84 219
6	1	Housing	82 310
7	2	Cylinder bolt 3m 6x16	82 315
8	2	Magnets	03 003
9	2	Oval gearwheel	82 314
10	1	O-ring 24 x2	87 224
11	2	Cylinder bolt 4m 6x10	82 316
12	1	Cover	82 311
13	4	Cylinder head screw M6 x12	82 317
14	2	Battery LR1 Lady	88 431
15	1	Compression spring 0,6 x 4,6 – 8,6 x 9	03 181
16	1	O-ring 11 x 1,5	87 406
17	1	Locking screw	82 318
18	1	Retention G1/8 " i - M10x1 a	12 016
19	1	Angled spout 2 x R1/8 " male	02 427
20	1	Retention R1/8 " a - M10x1 female	12 086

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