NUMERIxx^3

Mechanical oval gear meter • three digit

2 - 100 l/min

FMT Swiss AG

82 550 A801 GB

Contents

1. General Information

1.1 Intended use

The mechanical oval gear meter may only be used to measure self-lubricating, low-viscosity fluids.

Danger!

Never use it to measure explosive fluids such as petrol, or other fluids with similar flashpoints!

To ensure that usage stipulations are met, read through the operating instructions completely before using the meter and observe all stipulations.

Any departure from the usage stipulations (other fluid media, use of force) or user modifications (changes, use of non-original parts) can be dangerous and are considered as non-stipulated usage.

The user is liable for any damage resulting from non-stipulated use.

Repairs and maintenance are only to be carried out by qualified specialists.

Only original replacement parts are to be used for any repairs, otherwise the warranty will be invalidated.

1.2 Design and functional description

The mechanical oval gear meter was designed to accurately measure diesel, heating oil and other self-lubricating, low-viscosity fluids.

The oval gears, which are driven by the fluid, rotate the gear wheels in the meter head.

The gear mechanism drives the litre counter.

The mechanical oval gear meter has two displays:

- Three digit daily counter, resettable, graduated 100 ml.
- Six digit total counter, not resettable, graduated in 1 l steps, after 999.999 l the counter returns to 0.

1.3 Technical Data

Type		**NUMERIxx[3]**		
Operating principle		Oval gear		
Delivery rate	l/min	2 - 100		
Operating pressure max.	bar	3,5		
Storage temperature	°C	-10 to +80		
Storage humidity max.	%	95		
Operating temperature	°C	-10 to +60		
Flow pressure loss with diesel	l/min	30	60	90
	bar	0,05	0,2	0,4
Calibration accuracy	%	± 1		
Repeatability	%	± 0,3		
Trip counter		three digit		
Total counter		six digit		
Graduations	l	0,1		
Connections		G 1“ i		
Weight	kg	1,1		

Table 1-1: Technical Data

1.4 Operational Area Requirements

Heating oil and diesel are water polluting substances. Therefore the country specific rules and regulations regarding the delivery and storage of such fluids must be obeyed.

According to § 19g WHG (Germany) the filling installation must be so constructed and built, maintained and operated, such that water pollution and/or any other environmental damage is prevented.

The operator of such an installation is, according to § 19i WHG (Germany) responsible for continuous monitoring to ensure compliance with the above stated requirements at the installation.

2. General safety instructions

2.1 Information on safety at work

The mechanical oval gear meter has been designed and built in compliance with the applicable safety and health reaquirements of the relevant EU directives.

Nevertheless, there can still be risks if the product is not set up or operated as stipulated.

Therefore, before using the meter, read these operating instructions and pass them on to other users.

When operating the meter, the local safety and accident prevention rules and regulations always apply, as well as the safety advice in the operating instructions.

Caution!

The incorrect installation or use of the mechanical oval gear meter can lead to personal injury or material damage!

Before starting to use the meter, read through these operating instructions carefully and completely.

2.2 Signs and symbols used in the safety instructions

The safety advice provided in these operating instructions is categorised according to different danger levels. The different danger levels are identified within the instructions by the following symbols and identifying words:

Pictogram	Keyword	Consequences of failure to comply with the safety instructions
	Danger	Death or very serious injury
	Caution	Possible risk of slight to medium physical injury or material damage

2.3 Hazards that may arise in connection with the oval gear meter

Danger!

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 from the power supply.

Caution!

Do not pump contaminated fluids!

- Take special care to ensure that there is no contaminant in the fluid to be pumped.
- Install a strainer on the suction pipe.

Danger!

Damaged attachments and accessories can lead to personal injury and material damage

- Suction and pressure pipes must not be kinked, twisted or stretched.
- Attachments and accessories must be checked for wear, splits or other damage at all times.
- Damaged attachments and accessories must be replaced immediately.
- With reference to the period of use, please note the details in ZH 1/A45.4.2 or DIN 20066 part 5.3.2.

Caution!

Spilled fuel can result in environmental damage

- Local and country rules and regulations relating to domestic water supplies and fuel storage must be obeyed.

3. Installation

The mechanical oval gear meter can be installed in any position on either pipes or hoses, or directly on pumps or tanks. Connect the meter via its G 1 - internal thread.

The meter has a pre-set flow direction, which is identified by an arrow on the underside of the body. In standard form it is delivered as shown in option 1 in Fig. 3-1.

To use options 2 to 4, the complete meter head assembly can be rotated in 90° steps relative to the rear housing. To do this, follow the instructions given in Chapter 6.4 of these Operating Instructions.

4 blind holes are provided in the rear of the meter housing for attachment purposes. An M5 thread can be cut in these.

Ensure that no solid matter gets into the measurement chamber, since this will prevent correct operation of the oscillating disk.
A filter should therefore be installed before the meter. We recommend a filter with a pore-size of 400 µm.

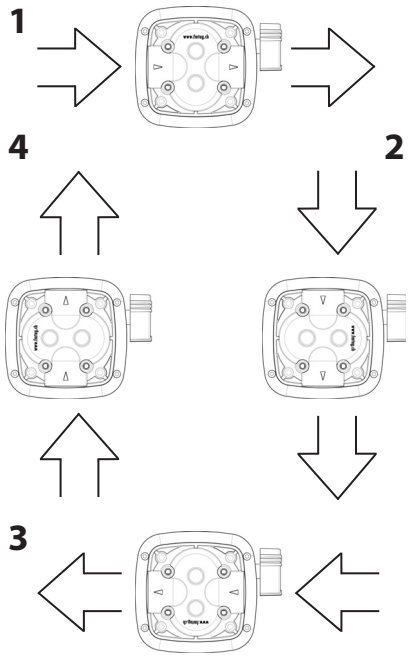


Figure 3-1: Mounting Options

4. Operation

To set the daily counter to zero, rotate the reset knob clockwise. The total counter reading cannot be reset.

Caution!

- Ensure that the operating pressure, as given in the chapter on „Technical Data“, is never exceeded!

5. Maintenance

The oval gear meter is very easy to maintain and service.

Should the accuracy of the meter reduce after a time, then dismantle it as described in Chapter 6, and clean it. Use a soft brush, and take care not to damage the measurement chamber and oscillating disk.

Damaged components must be replaced only with original FMT spare parts.

6. Dismantling the Meter

The mechanical gear meter can be dismantled quite easily. In addition, its modular construction means that the pipe work does not need to be removed.

Before starting to dismantle the meter, ensure that all fluid has been removed from it and the connected fuel line.

6.1 Removing the Counter Unit

Undo the securing screw for the reset knob, (Item 1), pull the knob (Item 11) out of the housing.

Undo the four screws (Item 2) at the rear of the meter, and pull the cover (Item 5) off towards the front.

Undo the two screws (Item 9) und remove the counter unit.

Refit the counter unit in the reverse order.

6.2 Cleaning the Measurement Chamber

Loosen the four screws (Item 12).

Take out the housing upper-part (Item 40) with the counter mechanism. Be careful of leaking fluid.

Remove the gear unit.

After cleaning and examining the measurement chamber, refit it in the reverse order. To guarantee correct operation, ensure the following:

- Insert the oval gears in the right position (Item 50/52).
- Check and lubricate the sealing rings before carefully inserting them.
- Tighten the screws securely.

6.3 Checking the Gear Wheels

Follow the first three instructions as described in Chapter 6.2, to remove the housing upper- part.

Carefully remove the gear mechanism cover (Item 44).

You can now check the gear wheels and, if necessary, remove any dirt.

Refit in the reverse order. Confirm after refitting the gear mechanism that the gear wheels rotate easily.

6.4 Adjusting for flow direction

To enable the meter to be adjusted for the flow direction, the screws (Item 12) must first be loosened.

Now you can rotate the housing upper-part in 90° steps, until the desired position is achieved.

Reassemble the meter in the reverse order.

7. Troubleshooting

Problem	Cause	Solution
Leaking from the shaft seal	Seal is damaged	Return the meter to the FMT-Customer Service for the seal to be replaced
Unsatisfactory accuracy	Measurement chamber is contaminated or blocked	Clean the measurement chamber (see Chap. 6.2)
	Air is present in the fluid to be measured	Check the pipelines for leaks, and fix them
Low flow rate of the installation	Measurement chamber is contaminated or blocked	Clean the measurement chamber (see Chap. 6.2)
	Filter is contaminated or blocked	Clean or replace the filter

8. Repairs/Service

The meter was developed and produced according to the highest quality standards.

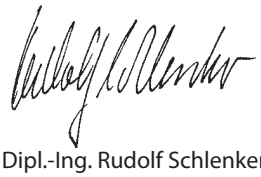
Should a problem develop, despite all quality controls, please contact our customer service:

FMT Swiss AG
Tel +49 9462 17-216
Fax +49 9462 1063
service@fmtag.ch

9. Manufacture's Declaration

We hereby declare that the product described here, its concept and construction, including this particular model, complies with the EC requirements. Any change to the product, not approved by us, will invalidate the declaration.

25.04.2013 FMT Swiss AG



Dipl.-Ing. Rudolf Schlenker

10. Exploded drawing

No.	Quantity	Description	Prod. no.
1	1	Fillister screw M 3 x 10	00 269
2	4	Pan head screw 3,5x20, Assy	82 388
3	1	Cylindrical pin 6x8	00 358
4	1	Display panel	82 375
5	1	Housing lid	82 495
6	3	Spring	88 235
7	3	Grid 1,5x4,7x11,25	88 234
8	2	Central sleeve D4,5xD5,5x4	82 539
9	6	Countersunk screw DIN 7500 M4x12 – zn	88 251
10	3	Shim DIN 988 20x11x0,5 – Steel	83 887
11	1	Adjusting wheel	88 243
12	4	Cap screw DIN 912 M6x16	88 419
13	2	Washer DIN 9021 D4,3xD12x1	88 253
14	2	Lock washer DIN 6799 D5	88 247
15	1	Pressure spring	88 256
16	2	Counter wheel large	88 232
17	1	Counter wheel large with scale	88 231
18	3	Gear wheel Z20	88 233
19	2	Spacer D6,7xD19,5x2,6	82 549
20	1	Shaft D6,5x112	82 547
21	1	Gear wheel Z8	82 498
22	3	Lock washer D3	88 248
23	3	Shaft D4x91,6	82 380
24	5	Gear wheel Z8	88 227
25	1	Lock washer D2	00 747
26	1	Shaft D3x91,6	82 379
27	5	Counter wheel small	88 225
28	1	Counter wheel small with drive	88 224
29	1	Washer DIN 125 D4,3	00 724 878
30	2	Bevel gear	82 514
31	3	Lock washer DIN 6799 D3,2	82 553
32	1	Gear wheel Z10-Z10	82 546
33	1	Shaft SW 4x92,6	82 378
34	1	Gear wheel Z38	82 497
35	2	Side plate 1,5x51,7x92	82 548
36	1	Lock washer D5	82 387
37	1	Gear wheel Z33-SW8	82 500
38	1	Axle SW8-SW4-19	82 541
39	1	Axle box D12x7	82 542
40	1	Housing upper-part	82 543

No.	Quantity	Description	Prod. no.
41	1	Shaft sealing ring FKM D5xD9x2	82 537
42	1	Axle box D12x5	82 538
43	1	O-Ring-NBR70 50x1,5	82 385
44	1	Transmission cover	82 540
45	2	Gear wheel Z33/Z10	82 513
46	1	Axle SW8x22	82 536
47	1	Cylindrical pin DIN 7 ISO 2338 D4x4	82 383
48	1	Intermediate cover	82 534
49	1	O-Ring-NBR70 68x1,5	82 357
50	1	Oval gear	82354
51	2	Cylindrical pin DIN 7 D8x36	82 355
52	1	Oval gear with gear wheel	82 533
53	1	Housing lower part	82 351
54	2	Gear wheel Z8	88 229
55	1	Gear wheel Z10	82 499
56	1	Shim DIN 988 5x10x0,3	82 384

Table 10-1: Captions for Fig. 10-1

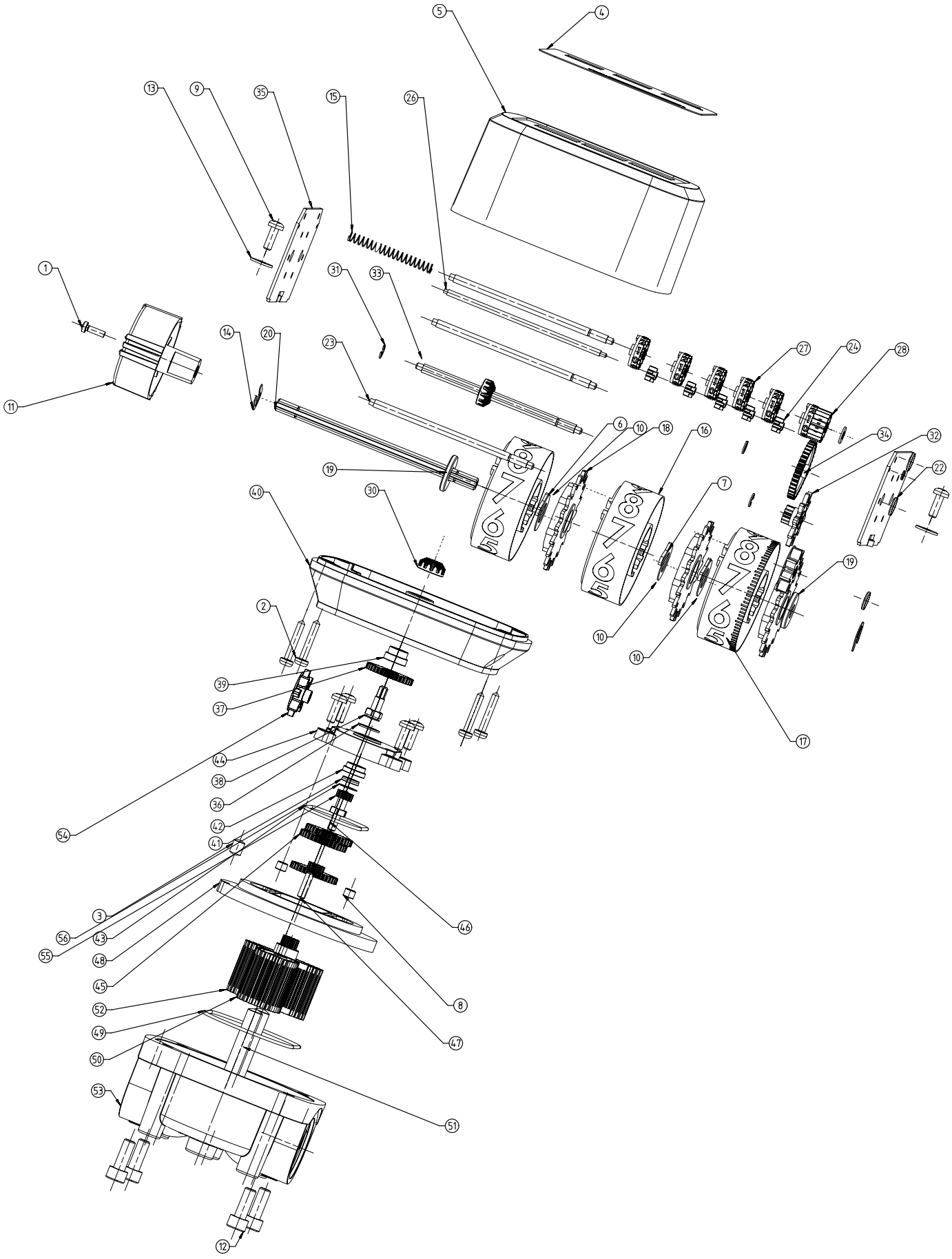


Figure 10-1 Exploded diagram of Oval Gear Meter

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