Oil hose end meter

Operating instructions



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1. General details

1.1 Intended use

- The hose end meter was developed and built for the precise measurement and determination of volumes of different media having various viscosities.
- The hose end meter is intended for fitting to the end of a dispensing hose, e.g. a hose reel.

1.2 Layout and functional description

- The hose end meter is an oval-wheeled counter with an electronic metering system and a digital display.
- The medium flowing through the meter sets two oval cogwheels in rotation, and this causes two impulses to be passed on to the electronic measuring mechanism from two reed switches which are displaced with respect to each other. These impulses are converted by a certain factor into the actual volume which has flown through, and is shown on the display.
- The factor has been set by the manufacturer to an average value suitable in most cases, but if necessary it is simple to reset it to customer-specific requirements using the pushbutton located in the casing.
- For the calibratable model, the display and the pushbutton in the casing are equipped with a lead seal.
- The total amount is also recorded, and can be displayed by pressing the 'Total' button.
- Data capture and evaluation are continually monitored electronically, and errors which may occur are displayed.
- The electronic measuring mechanism requires a two-phase input signal which is monitored for phase errors. A self-test is carried out automatically at every reset.
- The volume flow can be started and stopped by means of the manually activated valve positioned upstream of the meter. The anti-drip mouthpiece fitted below the meter ensures the immediate stopping of the flowing medium, and prevents after-dripping.
- Two sealed flush push buttons are all that is needed for operation: Reset and Total.
- The electronics are protected against shock and sealed against the entry of oil. This corresponds to the RFI and EMI shock test conditions.

1.3 Technical data

Description	not calibratable	calibratable
Measuring mechanism	Oval wheels	Oval wheels
Volume flow	1 to 30 litres/min	1 to 10 litres/min
Max. operating pressure	70 bar	16 bar
Temperature range	- 10°C to + 50°C	- 10°C to + 50°C
Viscosity	8 to 5000 mPass	8 to 5000 mPass
Precision	± 0,5 %	± 0,3 %
Repeatability	± 0.3 % of the displayed value	± 0.2 % of the displayed value
Display	LCD	LCD
Partial quantity	5-place, resettable	5-place, resettable
Total quantity	6-place, resettable	6-place, resettable only in calibration mode
Resolution	0.002 litres	0.002 litres
Minimum dispensable quantity	0.5 litres	0.5 litres
Unit of measure	Litres or Gallons	Litres or Gallons
Batteries	2x LR 1_1.5 Volt	2x LR 1_1.5 Volt
Connection thread	G ½"	G ½"

Table: 1-3: Technical data

2. General safety instructions

2.1 Information on safety at work

- The hose end meter has been designed and manufactured in compliance with the applicable safety and health requirements of the relevant EU directives.
- However, hazards may result from the use of this product if it is not used as intended or with the required care.
- When operating the hand-held volume flow meter, local safety and accident protection regulations are always valid, as well as the safety instructions in these operating instructions.

2.2 Discription of the to be applied safety instructions

The safety instructions included in these operating instructions are linked to the following hazard rating. This hazard rating is indicated in the instructions with the following keyword and pictogram:

Pictogram	Keyword	Consequences if the safety instructions are not complied with
	Attention	Potentially light to moderate physical injury or material damage

Table 2-1: Classification of the safety instructions according to type and severity of the hazard

In addition, further instructions are provided which give general tips on handling the product.

Pictogram	Keyword	Meaning
	Instruction	Background knowledge or tips on how to handle the product correctly

Table 2-2: General instruction

2.2 Safety instructions on hazards relating to handling the hand-held volume flow meter



Attention!

- The hose end meter is suitable only for use with media of low flammability.
- The hose end meter must not be used in explosion hazard areas.



Instruction

§ 19g WHG is particularly important. It prescribes that filling equipment must be acquired, installed, set up, maintained, and operated in such a way that contamination of water bodies or any other lasting modification of their properties is avoided.

Under § 19i WHG, the operator of such equipment is obliged to permanently monitor his equipment so that the above-mentioned requirements are complied with at the filling location.

3. Installation

- The meter is supplied ready mounted.
- Depending on the model, accessories may or must be fitted.



Information

When fitting, ensure cleanliness and an exact connection and sealing (copper seal or Teflon tape) with the oil pressure hose.

4. Preparing for Operation

4.1 Resetting the partial quantity measuring mechanism - RESET

The most recently dispensed volume held in the partial quantity memory can be set to zero using the RESET button. A reset is not possible while dispensing.

4.2 Dispensing procedure

The dispensing procedure is started or interrupted by pressing or releasing the activation lever. If the activation lever is pressed again, the dispensing process is continued from the point where it was interrupted, as long as the RESET button was not pressed beforehand. The displayed value is retained until the RESET button is pressed.

During the dispensing process all button commands are ignored!

4.3 Display of total quantity

If the TOTAL button is pressed, the display changes to the total quantity counting mechanism. This counter can be set to zero only in programming mode.

4.4 Function monitoring

A self-test of the metering mechanism is carried out automatically every time that the Reset button is pressed. All segments are displayed briefly and then all segments are cleared before the display is set to zero. Impulses received during the self-test are recorded and evaluated. All other stored values (correction factor, unit of measure) are checked. Only when all values are in agreement is metering possible. If this is not the case, the error message "ERR" appears on the display.
The meter permanently checks the direction of flow and the impulses received during a dispensing procedure. If the oil flow reverses or the metering system produces illogical signals, then "ERR" also appears on the display. If "ERR" appears repeatedly during a dispensing process, the hose end meter must be repaired.

4.5 Programming

For programming, the locking screw (item 11) must be removed from the housing (diagram 8-1).
For this, a seal must first be removed from the calibratable model, so that only authorised individuals can carry out this procedure.

Keep the programming button which is located in the housing pressed for about 5 sec. and then step through the ranges one after another by repeatedly pressing the button once.

The following ranges are displayed:

a)	cal. 0.000 L	(calibration mode and unit of measure, L or Gal.)
b)	[––or––]	(direction of flow)
c)	CLr L	(reset total display)
d)	1.000	(calibration factor)

Programming the unit of measure:

- Step to range "a".
- L
- Briefly press TOTAL and RESET simultaneously; the unit of measure changes from one unit to the other.
- Gal.

Programming the direction of flow:

- Step to range "b".
- [– –
- Briefly press TOTAL and RESET simultaneously; the direction of flow changes from one direction to the other.
- – –]

Set Total meter to zero:

- Step to range "c".
- CLr L.
- Briefly press TOTAL and RESET simultaneously; the Total display is set to zero.

Reading off the calibration factor:

- Step to range "d".
- Display e.g. 1.000.

Example - correction of the precision of measure:

- Dispense an amount into a measuring container (e.g. 5 litres).
- Compare the dispensed amount with the displayed volume.
- e.g.: 5 litres in the container – 4.950 litres on the display.
- Step to range "a".
- By pressing the TOTAL button "amount becomes smaller"
  or RESET "amount becomes larger"
  match the displayed amount with the actual amount.
- By pressing the programming button again for a longer period, the modified value is stored.

5. Maintenance

In principle, the hose end meter is low maintenance.

Because of the operator's responsibility under § 19i WHG, the following parts must be regularly examined to avoid environmental, material, or personal damage:

- The meter housing must be regularly examined for damage.
- If a battery change is necessary, this is indicated by the display of the Battery symbol.
  Carefully open item 7 (diagram 8-1) to allow two 1.5 V (LR1 batteries) to be removed and replaced. Carefully screw the cover back on.

- The sieve, item 29 (diagram 8-1)must be cleaned from time to time, respektive to its dirtiness.

6. Repair/Service

The hose end meter was developed and manufactured in adherence to the most stringent quality standards.

If in spite of all the quality measures taken, a problem occurs, please contact our customer service:

FMT Swiss AG
Tel.: +49 9462 17-246
Fax: +49 9462 1063
service@fmtag.ch

7. Manufacturer's declaration

We hereby declare that the equipment described below fulfils the relevant requirements in its design and construction, and in the model which we have put into circulation. If the equipment is used other than for its intended purpose, this declaration loses its validity.

Equipment	Hand-held volume flow meter, digital
EU directive	EU directive on electromagnetic compatibility (89/336/EEC) subsequently 93/31/EEC
National standard applied	DIN VDE 0843 T1

26.11.2009

FMT Swiss AG

Dipl.-Ing. Rudolf Schlenker

8. Exploded view

Item	Quantity	Item no.	Description
1	1	88 411	Rubber protector
2	1	88 417	Film
3	1	88 408	Support for circuit board
4	1	88 407	Circuit board, complete
5	4	88 421	Sheet metal screws
6	1	88 435	Flat seal
7	1	88 414	Locking screw
8	1	00 725	O-ring
9	1	03 181	Pressure spring

Item	Quantity	Item no.	Description
10	2	88 431	Battery
11	1	88 424	Locking screw
12	1	03 262	O-ring
13	1	88 423	Oval head screw
14	1	88 402	Upper part of housing
15	4	88 416	Permanent magnet
16	2	88 405	Oval wheel
17	2	88 406	Bearing pins
18	1	88 429	O-ring
19	1	88 401	Lower part of housing
20	4	88 419	Allen key bolt
21	4	88 425	Screws
22	1	88 440	Right hand half of handle
23	2	00 723	O-ring
24	1	88 412	Threaded nipple
25	1	88 413	Counter nut
26	1	88403	Handle piece
27	1	88 441	Handle shell, left
28	1	19 616	Rotating joint
29	1	88436	Sieve
30	1	88 427	O-ring
31	1	88 430	Shaft seal
32	1	88 426	Pressure spring
33	2	01 547	O-ring
34	1	88 410	Valve slide
35	1	88 427	O-ring
36	1	88 428	O-ring
37	1	88 409	Valve body
38	2	88 248	Starlook securing washer
39	1	88 418	Bushing
40	1	88 415	Rotating pin
41	1	88 404	Lever

			Item no. 19 698
45	1	19 746	Outlet hose

			Item no. 19 698 950
25	1	88 413	Counter nut
42	1	19 741	Bent outlet pipe
43	1	02 296	Copper washer
44	1	19 747	Anti-drip mouthpiece

Table 8-1 Key to diagram 8-1

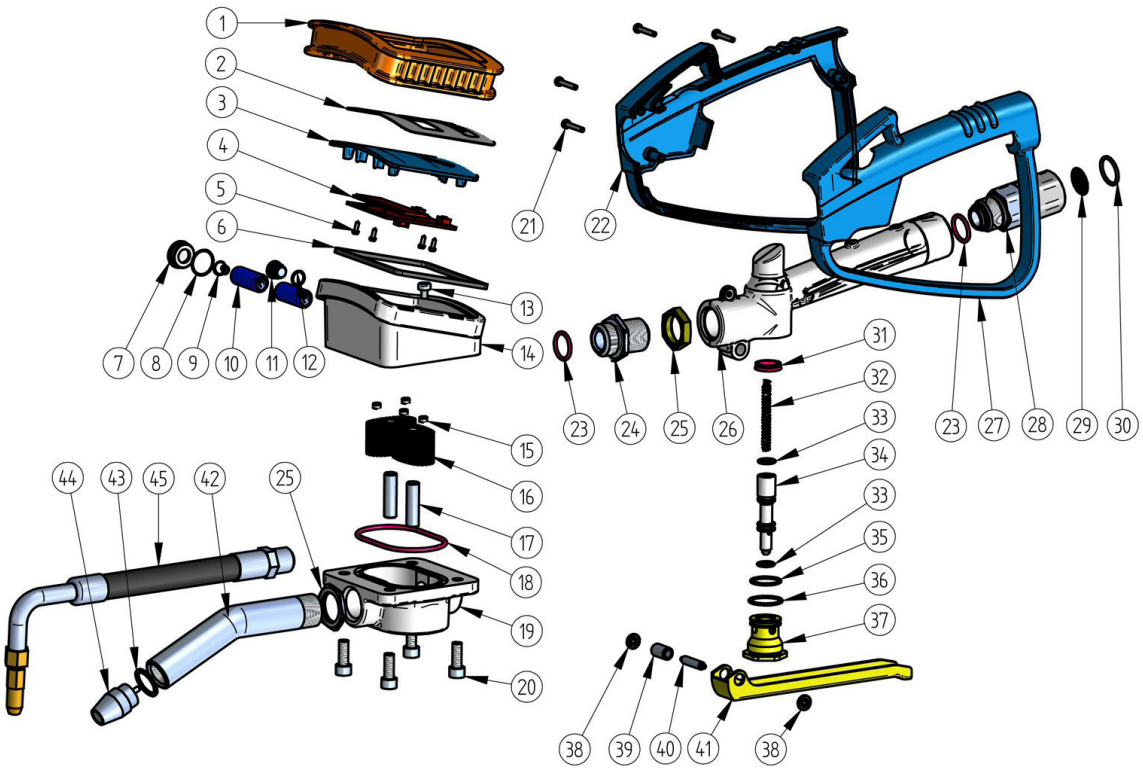


Diagram. 8-1: Exploded diagram of the hand-held volume flow meter

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