


**Acid capacity flowmeter: FM
FlowMeter V1.3 01.17**


 **Please read these operating instructions carefully and file for future reference.**


1. Applications:


The FM acid capacity flowmeter is designed to measure and display the volumetric fluid flow in partial demineralisation cartridges. Measuring and monitoring of delivery is dependent on the acid capacity and cartridge size. An acoustic signal is issued when the selected delivery volume is exceeded.

2. Safety notes

Please note that the FM FlowMeter should only be used for the intended purpose. Failure to comply with operating instructions may invalidate your guarantee!

 **Please observe valid health and occupational safety regulations at all times!**

 **Never attempt repairs to the machine or its AC adapter. Housing panelwork containing live componentry should only be opened by suitably qualified personnel.**

 **Only connect the AC adapter to a properly installed wall socket.**

 **Use only the AC adapter provided.**

3. Scope of delivery

FM FlowMeter parts list

1. 1 FlowMeter unit
2. Flowmeter complete with supply lead, with ¾" connections and spacer bolts
3. LED complete with connection cable
4. AC plug unit with adapters for AUS/EU/UK/USA
5. 4 S6 rawl plugs for wall assembly
6. 4 Torx raised head screws, galvanised, 4.5 x 50 mm
7. 2 self-tapping screws, M4x10
8. 2 self-tapping screws, M4x30
9. 5 self-locking cable ties
10. Operating instructions
11. 1 hose, 1940 mm long, ¾"
1 straight / 1 angled
12. 1 hose, 1500 mm long, ¾"

4. Unboxing and inspection:

Unbox the machine carefully, check that no items are missing and inspect the condition of the unit. Any complaints should be made immediately. Never attempt to operate a unit which is not in perfect working order.

5. FM FlowMeter installation

Housing unit

- Remove the fixing rail from the grey bracket on the FM FlowMeter and affix on mounting bracket with two M4x10 bolts.
- Clip the meter in place on the fixing rail.
- Secure the flowmeter's mounting bracket in the housing unit with two M4x30 bolts.
- Connect the hoses supplied.
- Fit the LED unit
- Make all necessary connections at the FM FlowMeter (flowmeter, LED, AC adapter). Use the cable ties provided to secure the cables.
- Plug the AC plug unit into a suitable wall socket using the appropriate adapter.
- The FM FlowMeter is now ready for operation.

6. Installation of the FM FlowMeter

Wall mounting

- Remove the fixing rail from the grey bracket on the flowmeter and bolt to the wall with two 4.5 x 40 mm screws and rawl plugs.
- Clip the meter in place on the fixing rail.
- Secure the flowmeter to the wall using two screws and rawl plugs.
- Connect the hoses supplied.
- Make all necessary connections at the FM FlowMeter (flowmeter, LED, AC adapter). Use the cable ties provided to secure the cables.
- Plug the AC plug unit into a suitable wall socket using the appropriate adapter.
- The meter is now ready for operation.

FM FlowMeter operation



Connection Flow meter Button Set1 Button Set2 Connection ext. LED Connection AC adapter

■ **Switching on:**

When the unit is switched on (by plugging in the 9 V AC adapter), the flowmeter indicates one of two possible conditions: Depending on the last use, the unit either switches to standby or continues to meter fluid flow.

■ **Standby:**

3 dashes are shown in the display.

Continued metering:

The display either shows 'rotating' zeros (in the event that fluid flow is detected) or the remaining quantity is displayed (below 1000 l).

If there is no fluid flow in 'Operation' mode, either static zeros or a static figure (below 1000 l) is shown in the display.

Press the 'Set1' and 'Set2' buttons for approx. 2 seconds to revert to 'Standby' mode (cf. section entitled 'Termination').

If the unit is in 'Standby' mode (three dashes in the display), press the 'Set2' button for 2 seconds to start counting fluid flow (cf. 'Operation').

▪ **Operation:**

Press 'Set2' for two seconds in 'Standby' mode (3 dashes in display).

A signal sounds and the display is reset.

The start of a new cartridge and the calculatory delivery volume based on the selected cartridge size and the acid capacity is saved to memory (EEPROM).

'Rotating' zeros appear in the display as soon as the first impulses from the flowmeter sensor are detected.

The delivered volume is counted down to a precision of 1 l and data saved to memory every 10 l (see below).

Once delivery capacity drops to 1000 l, the relevant figure is shown in the display and continuously refreshed to a precision of 1 l.

The red LED is permanently activated once the delivery capacity drops to 200 l. If a depleted cartridge (0 l delivery capacity) continues to be used, the delivery volume continues to be counted, in this case indicated by a 'minus' symbol in the display.

The LED now flashes at intervals of 1 second and the buzzer sounds solidly for 30 seconds (repeated every 5 minutes), if activated in 'Settings'. The display is frozen at '-1000' and no longer continues to count. The acoustic alarm is automatically deactivated after 2 hours.

The operator can deactivate or activate the acoustic alarm by pressing 'Set1' or 'Set2' at

any time. A deactivated acoustic alarm is indicated by a small triangle in the top left corner of the display.

The alarm is always reactivated after a restart or power failure unless permanently deactivated in 'Settings'.

If previously activated, the unit resumes counting fluid flow after a power failure. This may result in a maximum discrepancy of 10 l.

▪ **Termination:**

Under certain circumstances, it may be necessary to terminate the programme for a current cartridge prematurely.

To do this, simply press and hold the 'Set 1' and 'Set 2' buttons for approx. 2 seconds until a signal sounds and three dashes appear in the display.

Previously selected acid capacity and cartridge size entries remain active!

The counter is now in standby and can be set and started as described above.

Note: Programme termination cannot be cancelled. The counter is reset!

▪ **Standby/Settings:**

In standby, the acid capacity, the cartridge size (TE-P 2000 or TE-P 2800) and the acoustic alarm can be selected. To do this, press and hold 'Set1' for 2 seconds. 'AC' appears in the display followed 1 second later by the last selected acid capacity. At initial commissioning, AC = 5 and cartridge size = small).

Select the acid capacity in increments of 0.5 in the 1.0 – 10.0 range by pressing the 'Set2' button.

Then hold the 'Set 1' button pressed again for 2 seconds to save the acid capacity before moving on to select the cartridge size.

Cartridge sizes up to TE-P 2000 are indicated by a lower-case 'o' in the display; an upper-case 'O' indicates a cartridge size up to TE-P 2800.

The 'Set2' button is used to select the required container size. Press and hold 'Set1' for 1 second to save the cartridge size before setting the acoustic alarm. Then the 'bu' indicator appears followed by 'on' for an active signal or 'off' for a deactivated signal. Use the 'Set2' button to toggle between 'on' and 'off'.

When the alarm is deactivated, a small triangle appears in the top left corner of the display. To activate the alarm, hold the 'Set1' button pressed until three dashes once again appear in the display. The setting for the acoustic alarm is saved. All values are saved to non-volatile memory and hence are not lost in the event of a power failure. Values can be altered at any time in 'Standby' mode.

(12.5 l of resin)

Acid capacity 4.3 mmol/l	Carbonate hardness in °dH	l
1	2.8	42,250
1.5	4.2	31,687
2	5.6	21,125
2.5	7.0	17,600
3	8.4	14,075
3.57	10	11825
4	11.2	10,563
4.5	12.6	9,506
5	14.0	8,450
5.5	15.4	7,744
6	16.8	7,038
6.5	18.2	6,531
7	19.6	6,025
7.14	20	5913
7.5	21.0	5,650
8	22.4	5,275
8.5	23.8	4,981
9	25.2	4,688
9.5	26.6	4,456
10	28.0	4,225

All values are approximations.
Source: Miele

**Operating instructions TE P 2800,
(19 l of resin)**

Acid capacity 4.3 mmol/l	Carbonate hardness in °dH	l
1	2.8	64,220
1.5	4.2	48,165
2	5.6	32,110
2.5	7.0	26,752
3	8.4	21,394
3.57	10	18,000
4	11.2	16,055
4.5	12.6	14,449
5	14.0	12,844
5.5	15.4	11,770
6	16.8	10,697
6.5	18.2	9,927
7	19.6	9,158
7.14	20	8,987
7.5	21.0	8,588
8	22.4	8,018
8.5	23.8	7,571
9	25.2	7,125
9.5	26.6	6,773
10	28.0	6,422

All values are approximations.

Source: Miele

7. **Technical data: FM**

Flowmeter
Single-line display
2 cartridge sizes selectable (2000 l and 2800 l)
Range: Acid capacity from 1.0 to 10.0
Optical and acoustic 'change cartridge' indicator
Wall bracket
Connection to external LED
Tolerance: +/- 2%, all other conditions being equal
Weight: 151 g
Dimensions: W 100 mm, H 125 mm, D 40 mm
(incl. wall bracket)
Operating temperature: 5°C – 65°C
Incl. 3/4" pressure hoses for connection to cartridges and machine
AC adapter
Input: 110 – 240 V AC
Output: 9 V DC
Adapters for AUS/EU/UK/USA/CDN
Power rating: 5 W
Sensor unit:
Fluid flow in direction of arrow
Flow rate: l/min
Temperature range: -10°C – 65°C
Connection: G 1/4"
Orientation: Any direction

8. **Environment**



Decommissioned machines contain valuable materials and should be recycled.

→ Dispose of separate to domestic refuse.

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