Badger Meter Europa GmbH

LM OG-Series

LM OG-A / LM OG-TAER / LM OG-T100 / LM OG-HFT

Oval gear meters with electronic register for lubricants - approved and non approved



INSTRUCTIONS FOR USE AND MAINTENANCE

October 2009

LM_OG_BA_90_0910

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1. Before putting into operation

Please check that the technical data of the installation match with those of the lube meter, for example connections, pressure, flow range and medium. Once the meter has been installed, please make sure that **no air, pressure shocks or particles** can damage the meter. Please check all connections to leakage. After the installation we recommend to do several transactions into an approved tank. Should the use of different oil viscosities show discrepancies by the error limit, this can immediately be corrected at the site. This avoids to remove or exchange the meter. In case of pretested meters can corrections be carried out by technicians or officials of the National Weights and Measure Laboratory.

2. Details of unit operation

2.1 Battery

The battery is exchangeable in all meters of the OG series while opening the cover on the front of the register. A new programmation is not necessary as the programmation does not get lost.
Battery type: **Lithium CR 123A or for approved meter LM OG-A: Lithium CR ½ AA**
A battery symbol is warning when battery change is necessary.

2.2 RESET

The display of the batch register memory can be put to ZERO by pushing the RESET button. A reset is not possible during a batch process. Resetting of the totalizer is only possible through internal programming.

2.3 Interruption of batch process

By releasing the meter trigger, the batch process is interrupted. When pulled again, the batch process will be continued at the very point where it was interrupted, unless the RESET button has been pushed in the meantime. The display will remain unchanged during the interruption. If the batch process is interrupted by external source – e. g. failure of a transfer pump – the procedure is the same.

2.4 Functional control

In normal operation, the register board totalizes flow in the lube meter by sensing reed switch actions, as described below. The batch display may be reset to zero by momentarily pressing the RESET button on the front panel. This action will set the batch accumulator to zero and cause the register to enter a selftest mode, as described below. For the self test, it is necessary that the display is activated with all numerics set to “8” and all other indicators set to “on” for a period of 0,8 seconds. If flow or reed switch action takes place during the self test period, the resultant pulses are processed as normal flow accumulations. This accumulation of flow can only be reset by pressing the RESET button, or by reprogramming the register for a different unit of measure. During the self test period, the meter will compare the double redundant storage of the correction factor, the unit of measure and direction of rotation. If two or more values do not correspond, the register will show a series of dashes (- - - -) and will become inoperative.
If flow sensing or reed switch action is present at any time and it is not preceded by a pressing of the RESET button, the flow accumulations will be added to the value already present in the batch accumulator.

2.5 Totalizer (LM OG-A)

Pressing the TOTAL button will cause the accumulator memory value to be displayed, for as long as the button is being pressed, but only as long as no volume pulses are coming in (see also calibration or correction factor). The factory programmed correction factor results from accuracy testing of bare meter with the mounted electronic register:

Example: Quantity dispensed: 4,2 litres, Quantity displayed: 4,0 litres, Correction factor k: 4,2/4,0 = 1,05

Pressing the TOTAL and the RESET button simultaneously in this sequence will cause the programmed correction factor to be displayed, as long as both buttons are depressed.
As soon as volume signals come in, all keyboard commands will be ignored!

As soon as pulses are totalized, the keypad is out of function!

2.6 LM OG-A: Monitoring of false pulses

During measurement, the microprocessor controls the phase position of both reed switches (30° to 150° phase shift).

Errors caused by incorrect phase sequence:
If more than two (2) phase errors are noted after a RESET, the LCD display is flashing slowly (1 second interval). This type of error is resettable by depressing the RESET button.
If it is nor possible to stop the flashing, there is another fault and the register has to be exchanged.
The flashing can e. g. also be caused by a short-time reverse flow when starting up the oil dispense system, or by an insufficiently areated oil pipe (pressure shocks). This can be prevented by installing an appropriate non-return valve.

Errors in stored variables: (i.e. correction factor, unit of measure, direction of rotation)
These errors are indicated by a series of dashes across the display and are not resettable. The register has to be removed from service.

2.7 Installation procedure LM OG

The meter series LM OG is equipped with a (1/2", 3/4", 1”) BSP female thread on the inlet side. In order to obtain a leakage free connection from the meter to the hose, the hose end must have an appropriate BSP male thread.

We recommend to proceed as follows before screwing in:

1. Clean both threads from fat.
2. Brush the male thread at the hose with liquid sealant (e.g. Eurolock 310100 or equivalent selaing of other manufacturers). Please be careful that no sealing gets into the meter.
3. Screw both parts together.
   Do not overtighten the screw connection, otherwise the swivel of the meter could be damaged.
4. The instruction of the sealing manufacturer should be absolutely followed.
5. The meter mounting should only be carried out by authorized specialist staff.

The right selection of the components as well as the mounting in accordance with the regulations is in the responsibility of the user.

3. Programming and use

LM OG-A (CND)
The units of measure and the correction factor can be programmed. A momentary contact programming button is located on the bottom of the register, which is accessible only when the register has been removed from the meter. Removing the register from the meter requires the removal of a sealed register mounting screw. This seal has to be restamped by the Office of Weights and Measures. Activating the programming button (by pressing it for 3 seconds) will immediately force the register into the program mode. Any reed switch activity during the program mode will cause the register to exit from the program mode.

Programming procedure LM OG-A

a) Upon initial activation of the board mounted program button, the register will display for example:
   - Correction factor = 1,0000 LM OG
     = 1,4700 LM OG-HF
   - Unit of measure L

   The programmable correction factor has a range of 0,0000 to 9,9999. The decimal point is always located after the first digit. When “litres” is programmed or selected as the unit of measure, the decimal point will immediately change to a comma and will remain so as long as “litres” is the selected or programmed unit of measure. (Default values are 0,0000, “clockwise” and “QT”, if no values have been programmed previously).

b) The unit of measure indicator in the display will immediately begin flashing at 0,3 second rate, all other display action being constant, indicating that the unit of measure is available for change. With each depression of the RESET button, the unit of measure indicator will step through its individual four values in sequence, which are (QT) – GAL – L – PT.

c) Depressing the TOTAL button will store the presently displayed data as the current value for the new setting.

d) Any depression of the RESET button will increment the first or left most digit of the correction factor. Depressing the TOTAL button will store the presently displayed value as the current value.

e) This depression of the TOTAL button in step d) will initiate flashing action of the next successive digit in the correction factor and allow it to be scrolled with the RESET button. All other digits will remain constant. This successive programming action will be continued for the remaining four digits of the correction factor. The four right most digits of the correction factor will be allowed to assume the full range of values from zero (0) to nine (9). Each depression of the TOTAL button will store the value present on the display as the current value for that digit.

f) Successive depressions of the TOTAL button will continue to enable flashing and scrolling of the digits or unit of measure in sequence. The action will continue even if a particular unit of measure or correction digit has already been selected by a previous action.

g) If no scrolling by the RESET button is undertaken between depressions of the TOTAL button, then the present value of a digit or unit of measure as displayed will be utilized as the current value for the digit or unit of measure.

h) Removing pressure from the program button at any time during the programming process will force the values presently displayed (just entered or previously entered) to be stored as permanent values. The storage of the new values will be indicated by the entire display flashing three times to acknowledge the process.

i) During the process of the programming operation as per item h) the seed number in the memory of the mP is multiplied by the correction factor. The result is the proper batch volume increment which corresponds to one input pulse. It will be stored as well as the unit of measure with simple redundancy to assure security.

j) The contents of the totalizer counter will be kept during reprogramming, as long as the unit of measure is not changed. If programming as described under h) is completed with a new unit of measure, the totalizer counter will automatically be zeroed. It does not matter if the units of measure have been toggled during the course of the programming only the final stored value is important.

   After release of the program button, the microprocessor will switch off all functions, incl. LCD display, only the data storage will remain constant. This status will remain unchanged until the RESET or TOTAL button are pressed. A new depressing of the program button enables a new switch off.

   The program button does not work after the microprocessor has been switched off as described above.

Example: Correction of the accuracy

Quantity dispensed: 1,6 l
Quantity displayed: 1,52 l
Correction factor k = **1,6/1,52 = 1,0526**

a) Display current correction factor by pressing and holding TOTAL and RESET buttons simultaneously.
Example: 0,9950 (Make a note of this number)

b) Calculation of the new correction factor:
0,9950 x 1,0526 = 1,0473

c) Press and hold program button until programming procedure is completed.

d) Display will show the following data:
- momentary correction factor
- unit of measure (flashing)

e) Press TOTAL button until right most correction factor digit that you wish to change begins to flash (in this case, 0).

f) Press RESET button until desired digit appears (in this case, 9).

g) Press TOTAL button until the next digit you wish to change begins to flash (in this case, the first 9).

h) Press RESET button until desired digit appears (in this case, 8).

i) Press TOTAL button until the next digit you wish to change begins to flash (in this case, the second 5).

j) The register module can now be remounted on the meter.

Note: After programming, display will be blank. Press RESET button to re-activate the display.

举例：精度修正
实际打油量：1.6 升
油枪显示值：1.52 升
修正系数k＝1.6/1.52=1.0526
a) 同时按住Total和Reset两个按钮显示当前的修正系数k
比方说为：0.9950（记下这个数字）
b) 计算新的修正系数：
0.9950×1.0526=1.0473
c) 拧下3个螺丝，将表从油枪上取下
d) 按住program按钮直到程序运行完毕
e) 此时表头将显示以下数据：
－ momentary correction factory 瞬时修正系数
－ unit of measure(flashing) 测量单位
－ direction of rotation 旋转方向
f) 按住Total按钮，直到你需要修改的数字闪烁（这个例子中，先输入1）
g) 按住Reset按钮直到需要的数字出现（这个例子中，0）
h) 按住Total按钮直到下一个你需要修改的数字闪烁（这个例子中，第一个4）
i) 按住Reset按钮直到需要的数字出现（这个例子中，7）
j) 按住Total按钮直到下一个你需要修改的数字闪烁（这个例子中，第二个3）
k) 释放Program按钮，显示将闪烁3次，然后显示新设定的值
l) 将设定好的表装回油枪。
注意：在设定过后，会没有显示。按住Reset按钮，显示将重新出现。

4. Programmation of LM OG (CND) LM OG(CND)的设置

Measuring unit
测量单位

„Total“ resettable
可重设总量

„Total“ not resettable
不可重设总量

Press „Total“ one time to switch on the meter.

按一次“Total”按钮切换到计量状态

Press 3 times „Total“ and 3 times „Reset“ to access the programmation mode. Measuring unit “L” (liter) is flashing and can be changed in L, GAL, QT or PT when pressing “Reset”. Press “Total” to confirm the new measuring unit.

按3下“Total”且按3下“Reset”切换到设置模式。此时测量单位“升”闪烁，且通过按“Reset”按钮可以改成加仑，夸脱，品脱等。按“Total”按钮对新单位进行确认

Press “Total” one time to change the k-factor.
The figure to be changed is flashing and can be modified with “Reset”.
To change the next figure, press “Total”.

按一次“Total”按钮可修改修正系数k. 正在闪烁的数字可通过按“Reset”按钮来修改. 修改下一个数字，按“Total”按钮

The second figure can now be chanced.
To access the next figure, press “Total”.

现在修改第二个数字. 修改下一个数字，按“Total”按钮

The third figure can now be chanced.
To access the next figure, press “Total”.

现在修改第三个数字. 修改下一个数字，按“Total”按钮

The fourth figure can now be chanced.
To access the next figure, press “Total”.

现在修改第四个数字. 修改下一个数字，按“Total”按钮

The fifth figure can now be changed.

现在修改第五个数字.

Press both buttons simultaneously to save the programmation.
The meter then goes to the sleeping mode.

同时按下两个按钮保存设置. 油枪然后进入睡眠模式

Sleeping mode

睡眠模式

After the sleeping mode, please press „Total“ to show the „normal“ display mode.

进入睡眠模式后，按“Total”按钮进入“通常”显示模式

Press „Reset“ during 3 seconds and the register displays the check sum.

按住“Reset”按钮3秒然后油枪显示校验和

5. Changing the battery

If you change the battery, please proceed as follows:

Picture 1: Loosen the battery cover

Picture 2: Take out the battery

Picture 3: Insert the new battery and press the reset button to check the function of the register

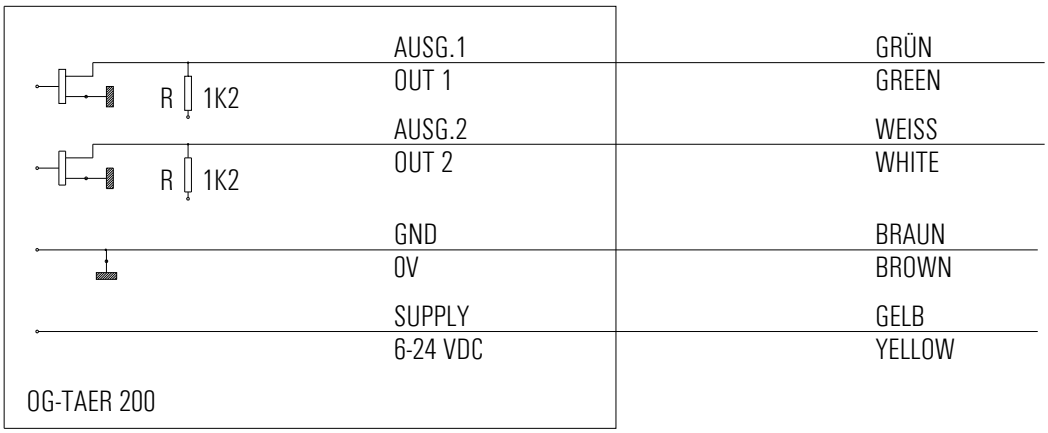
Picture 4: Insert the battery cover, then screw the battery cover tight

6. Wiring diagram LM OG-TAE(R) 2 x 100

LM OG-TAE(R) 2 x 100
102128, 102130, 102131, 103132

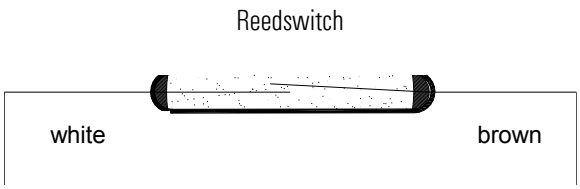
The wiring configuration is different for the meters **102128** and **102130** to: **channel 1 = white; channel 2 = green**

Wiring diagram



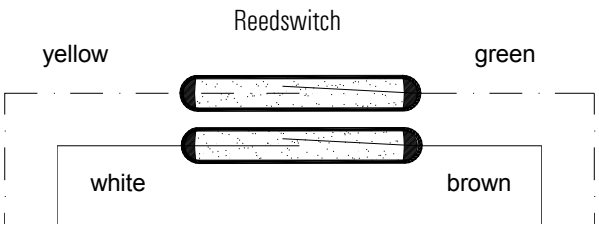
LM OG-T 100 / LM OG-HFT 1“ / LM OG-HFT 66,75 PPL
102101 / 102920 / 102915

Wiring diagram



LM OG-T 2 x 100
102106

Wiring diagram



7. Approvals

1.PTB approval n° (Germany)

5.241
95.50

2. OIML: PTB-1.5-4040056

3. BEV approval n° (Austria)

OE 96
R 261

BEV approval n° GZ 3477/2000

4. ČESKÝ METROLOGICKÝ INSTITUT: TCM 141/00-3436

5. GOST: 7057782

8. Manufacturer's declaration

Badger Meter Europa

CE

Herstellererklärung
Manufacturers Declaration

Bauart Typ ***Model Type***	Ölzähler *Lube Meter*	
Typenbezeichnung ***Model Name***	LM-OG, LM-1800 *LM-OG, LM-1800*	
Seriennummer	ab L96010001 ab L950100001 ab 4000	LM-OG LM-1800 LM-677
Serial Number	*from L96010001* *from L950100001* *from 4000*	*LM-OG* *LM-1800* *LM-677*
Baujahr ***Construction year***	ab 1995 *from 1995*	

Referenz / *Reference*:

Maschinen Richtlinien *Machine Directives*		CE-Richtlinien Elektrische Betriebsmittel *Electrical Device Directives*
89/392/EEC	91/368/EEC	2006/95/EC
94/44/EEC	93/68/EEC	2004/108/EC
98/37/EC		

Druckgeräterichtlinie *Pressure Equipment directive*	CE-Kennzeichnung *CE marking*
97/23/EC	93/68/EEC

Hiermit bestätigen wir die Übereinstimmung unserer Geräte mit den o.g. Richtlinien.
Vor Inbetriebnahme der oben genannten Geräte muss sichergestellt sein, dass die Gesamtanlage bzw. Maschine, in der die Geräte verwendet werden, den geltenden Richtlinien und Bestimmungen entspricht.

We herewith confirm that our products are in accordance with above mentioned directives.
The equipment identified above must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of above directives.

14.01.2009

Unterschrift
Qualitätsbeauftragter / QM-Manager:
E .Wannenwetsch

QM_LM-ZF_CE_d_e_108.doc 09/03

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9. DIN ISO Zertifikat / DIN ISO certificate / Certificat DIN ISO

ZERTIFIKAT ◆ CERTIFICATE ◆ 認証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

TÜV SÜD Management Service

CERTIFICATE

The Certification Body
of TÜV SÜD Management Service GmbH
certifies that

Badger Meter Europa GmbH
Nürtinger Strasse 76
D-72639 Neuffen

has established and applies
a Quality Management System for

Flowmetering and Control,
Design, Selling and Production.

An audit was performed, Report No. **70002816**
Proof has been furnished that the requirements
according to

ISO 9001: 2000

are fulfilled. The certificate is valid until **2011-02-13**
Certificate Registration No. **12 100 24674 TMS**

Munich, 2006-02-16

QMS-TGA-ZM-07-92

TÜV SÜD Management Service GmbH • Zertifizierstelle • Ridlerstraße 65 • 80339 München • Germany

10. Warranty

Badger Meter warrants meters and parts manufactured by it and supplied hereunder to be free from defects in materials and workmanship for a period of 18 months from date of shipment or 12 months from date of installation, whichever period shall be shorter. If within such period any meters or parts shall be proved to Seller´s satisfaction to be defective, such meters or parts shall be repaired or replaced at Seller´s option. Seller´s obligation hereunder shall be limited to such repair and replacement and shall be conditioned upon Seller´s receiving written notice of any alleged defect within 10 days after its discovery and, at Seller´s option, return of such meters or parts to Seller, f.o.b. its factory. THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES WHATSOEVER INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES (EXCEPT OF TITLE) OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Badger Meter shall not be liable for any defects attributable to acts or omissions of others after shipment, nor any consequential, incidental or contigent damage whatsoever.

Hotline

Please contact your supplier for any technical assistance you may need.

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