

PIUSI

K200

**ELECTRONIC
METER**



**MADE
IN
ITALY**

Use, maintenance and calibration manual

EN

BULLETIN MO119D EN_00

ENGLISH

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BULLETIN MO119

1 FACSIMILE COPY OF EU DECLARATION OF CONFORMITY

The undersigned: PIUSI S.p.A.

Via Pacinotti 16/A z.i. Rangavino - 46029 Suzzara - Mantova - Italy

HEREBY STATES under its own responsibility that the equipment described below:

Description : **GREASE METER**

Model: **K200**

Serial number: refer to Lot Number shown on CE plate affixed to product

Year of manufacture: refer to the year of production shown on the CE plate affixed to the product
complies with the following legislation:

- Electromagnetic compatibility

The technical file is at the disposal of the competent authority following motivated request at PIUSI S.p.A. or following request sent to the e-mail address: doc_tec@piusi.com.

THE ORIGINAL DECLARATION OF CONFORMITY IS PROVIDED SEPARATELY WITH THE PRODUCT

2 GENERAL WARNINGS

Important precautions

To ensure operator safety and to protect the pump from potential damage, workers must be fully acquainted with this instruction manual before performing any operation.

Symbols used in the manual

The following symbols will be used throughout the manual to highlight safety information and precautions of particular importance:

ATTENTION



This symbol indicates safe working practices for operators and/or potentially exposed persons.

WARNING



This symbol indicates that there is risk of damage to the equipment and/or its components.

NOTE



This symbol indicates useful information.

Manual preservation

This manual should be complete and legible throughout. It should remain available to end users and specialist installation and maintenance technicians for consultation at any time.

Reproduction rights

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3 SAFETY INSTRUCTIONS

3.1 SAFETY WARNINGS

Mains - preliminary checks before installation		You must avoid any contact between the electrical power supply and the fluid that needs to be FILTERED.
Maintenance control		Before any checks or maintenance work are carried out, disconnect the power source.
For your safety, review the major ATTENTION and cautions below before operating your meter		When metering flammable liquids, observe precautions against fire or explosion.
		When handling hazardous liquids, always follow the liquid manufacturer's safety precautions .
		Always dispose of used cleaning solvents in a safe manner according to the solvent manufacturer's instructions.
		During meter removal, liquid may spill. Follow the liquid manufacturer's safety precautions to clean up minor spills.
		Do not blow compressed air through the meter.
FIRE AND EXPLOSION		Connect the metal parts of the device to earth
		Stop operation immediately if static sparking occurs or if you feel a shock. Do not use equipment until you identify and correct the problem.
		Keep a working fire extinguisher in the work area.
EQUIPMENT MISUSE Misuse can cause death or serious injury		Do not operate the unit when fatigued or under the influence of drugs or alcohol.
		Do not leave the work area while equipment is energized or under pressure.
		Turn off all equipment when equipment is not in use.
		Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards.
		Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
		Do not kink or over bend hoses or use hoses to pull equipment.
		Keep children and animals away from work area.
Toxic Fluid or Fumes Hazard		Comply with all applicable safety regulations.
		Read MSDS's to know the specific hazards of the fluids you are using.
		Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
		Prolonged contact with the treated product may cause skin irritation: always wear protective gloves during dispensing.

3.2 FIRST AID RULES

NOTE



Please refer to the safety data sheet for the product.

SMOKING PROHIBITED



When operating the dispensing system and in particular during refuelling, do not smoke and do not use open flame.

3.3 GENERAL SAFETY RULES

Essential protective equipment characteristics

Wear protective equipment that is:

- suited to the operations that need to be performed;
- resistant to cleaning products.

Personal protective equipment that must be worn



Safety shoes;



Close-fitting clothing;



Protective gloves;



Safety goggles;

Other Devices

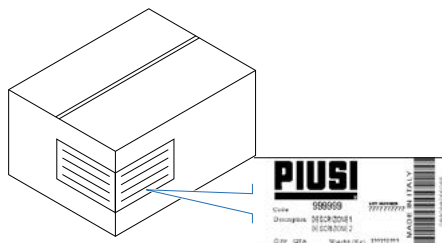


Instruction manual.

3.4 PACKAGING

K200 comes packed in a cardboard box with a label indicating the following data:

- 1 - contents of the package
- 2 - weight of the contents
- 3 - description of the product



3.5 PACKAGE CONTENTS/PRE-INSPECTION

FOREWORD	To open the packaging, use a pair of scissors or a cutter, being careful not to damage the dispensing system or its components.
NOTE	 In the event that one or more of the components described below are missing from inside the package, please contact Piusi inc technical support.
WARNING	 Check that the data on the plate correspond to the desired specifications. In the event of any anomaly, contact the supplier immediately, indicating the nature of the defects. Do not use equipment which you suspect might not be safe.

4 KNOWLEDGE K200

FOREWORD	K200 is an electronic meter based on oval gears measuring system, developed for an easy and exact measurement. K200 is studied in particular to be directly installed on lines of distribution of fluid. An electronic card with microprocessor permits control of the display and calibration of the meter. The oval gear measuring principle adopted offers high precision and low pressure losses together with a compact lightweight design and easy installation. An electronic card with microprocessor permits control of the display and calibration of the meter. K200 features a non-volatile memory for storing the measuring data of the totals, even in the event of a complete power break for long periods.
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K200 is available in 2 versions:

1	METER - with LCD display and calibration buttons
2	PULSER - single-channel impulse, connectable with a remote display.

4.1 COMPATIBLE LIQUIDS

Measurement system	Oval gear in acetal resin for measuring variable viscosity fluids. The fluids compatible with k200 are the following:
K200 HP meter e pulser	Diesel fuel, raps oil, oil and all the lubricating greases included between the "OOO" position and the position "2" of the nlgi consistency scale.

Main components

- 1 - Insert battery
- 2 - Display LCD
- 3 - RESET button
- 4 - CAL button
- 5 - Measurement chamber

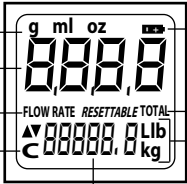
The measurement electronics and the LCD display are fitted in the top part of the meter, isolated from the fluid-bath measurement chamber and sealed from the outside by means of a cover.



4.2 DISPLAY LCD (ONLY METER VERSION)

**FORE-
WORD**

The “LCD” of the METER features two numerical registers and various indications displayed to the user only when the applicable function so requires.

1	Partial register (4 figures with moving comma: O.O · 9999), indicating quantity dispensed from when the RESET button was last pressed	7	Indication of battery charge
2	Indication of Flow Rate mode	8	Indication of unit of measurement of Partial: g = grams; ml = millilitres; oz = ounces
3	Indication of calibration mode		
4	Totals register (6 figures with moving comma O.O·999999), that can indicate two types of Total: 4.1 General Total that cannot be reset (TOTAL) 4.2 Resettable total		
5	Indication of unit of measurement of Totals: kg = kilograms; L = Litres lb = pounds		
6	Indication of type of total, (TOTAL / RESETTABLE TOTAL)		

4.3 USERS BUTTONS

Foreword

The METER features two buttons (RESET and CAL) which individually perform two main functions.

**Main Functions
Performed**

- for the RESET key, resetting the partial register and Reset Total
- for the CAL key, entering instrument calibration mode

Legend

Calibrate means performing actions on the meter keys. Below is the legend of the symbols used to describe the actions to be performed.

Short pressure of cal key 	Long pressure of cal key 	Short pressure of reset key 	Long pressure of reset key 
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5 HOW K200 METER WORKS

METER VERSION

K200 METER's metering system is based on a measuring chamber that contains two oval gears that, when rotating, generate electric impulses which are detected and processed by a microprocessor.

The gears are made to turn by the fluid flowing through the chamber. The volume of fluid that flows through is calculated by the number of gear rotations, given that each rotation corresponds to an identical amount of fluid. The magnetic coupling, between the magnets installed on the gears and a magnetic switch outside the measurement chamber, ensures measurement chamber sealing and ensures transmission of the pulses generated by gear rotation to the electronic board microprocessor. By applying an appropriate calibration factor, the microprocessor transforms the impulses into the amount of fluid (in weight) that has been dispensed, and displays the result on the LC display.

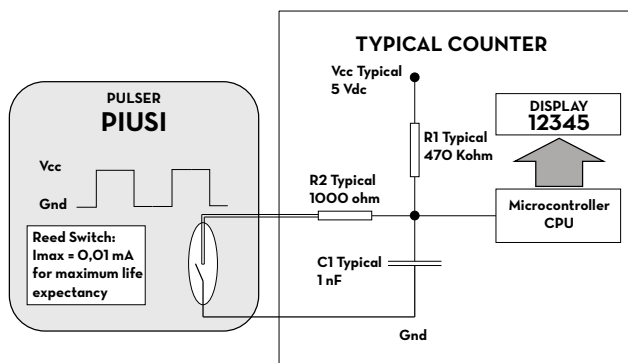
All K200 METER models are factory set with a calibration factor called FACTORY K FACTOR equal to 1,000.

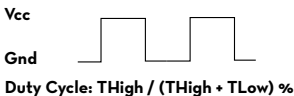
For best K200 METER performance - adapting this to the intrinsic characteristics of the fluid to be measured - the instrument can be "calibrated". Calibration can be restored to factory settings at any time (see "Calibrating").

PULSER VERSION

The Pulser version is a pulse emitter (reed bulb) which translates the magnetic field variations generated by gear rotation into electric pulses to be sent to an external receiver to be connected.

The pulser does not need any independent electric power supply, as it is directly powered by the receiver connection. The issued pulse type is represented by a square wave generated by the voltage variation - see the following diagram:





MODEL	FLOW RATE FIELD		PULSER		Frequency Signal Max	Square Wave Duty Cycle
	l / min.	g / min	Pulse / liter (approximately)	Pulse / Gal (approximately)		
K200	0,1 - 2,8	0,03 - 0,6	1400	5306	65 Hz	20 - 80%

The calibration of the instrument is made by means of the external receiver. The PULSER version must be connected by cables and respecting the following characteristics:

Vmax: 28 V - Ac / Dc - Imax: 100 mA

6 OPERATING MODES

OPERATING MODES

The user can choose between two different operating modes:
The meter features a non-volatile memory for storing the dispensing data, even in the event of a complete power break for long periods.
The measurement electronics and the LCD display are fitted in the top part of the K200 which remains isolated from the fluid-bath measurement chamber and sealed from the outside by means of a cover.

1 - NORMAL MODE

Mode with display of Partial and Total dispensed quantities.

2 - FLOW RATE MODE

Mode with display of Flow Rate, as well as Partial dispensed quantity.

7 INSTALLATION

FOREWORD

K200 can be installed directly on the tube for fluid delivery. The body is provided with two female threads 1/8" (BSP or NPT according to the versions) on which to install the tube for fluid.

ATTENTION



For installations on system, position K200 so that the battery housing can be easily reached.

Always make sure that the thread on the hose and on all attachments applied are compatible with the thread on the chosen K200 model. To avoid damaging the fluid handle, always fasten every component tightly using the appropriate tools. Make sure the fluid is free from impurities; foreign matter in the fluid can obstruct the measuring gears. For the fluid handle to function properly, air should be removed from the fluid supply line, ensuring a smooth and regular fluid flow.

8 DAILY USE

FOREWORD K200 is supplied ready to use. No commissioning operations are required even after long storage periods.

ONCE THE K200 PULSER HAS BEEN CORRECTLY CONNECTED TO THE IMPULSE RECEIVER, THERE IS NO NEED TO SWITCH IT ON OR OFF.

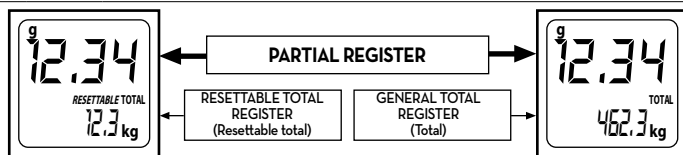
ATTENTION



- K200 METER is designed for professional use and should be operated only by authorised adult personnel.
- Do not use K200 METER in conditions exceeding the limits described in the "SPECIFICATIONS" section or with fluids other than lubricating fluid.
- Do not modify or tamper with K200 METER.
- Check K200 METER periodically to make sure it is in good conditions.
- K200 METER is a high-pressure fluid meter. Never aim the nozzle toward any part of your body or toward anyone else.
- Use all personal protection equipment prescribed by law.
- Discharge the pressure in the supply line before performing maintenance.

The only operations that need to be done for daily use are Partial and/or Resettable Total register resetting.

Below are the two typical normal operation displays. One display page shows the Partial and Resettable Total registers. The other shows the partial and general total. Switchover from Resettable Total to general Total display is automatic and tied to phases and times that are factory set and cannot be changed by the user.



- 1 The Partial register positioned in the top part of the display indicates the quantity dispensed since the RESET key was last pressed.
- 2 The Resettable Total register, positioned in the lower part of the display, indicates the quantity dispensed since the last ResettableTotal resetting. The Resettable Total cannot be reset until the Partial has been reset, while vice versa, the Partial can always be reset without resetting the Resettable Total.
- 3 The General TOTAL register (Total) can never be reset by the user. It continues to rise for the entire operating life of K200 METER.

The register of the two totals (Resettable Total and Total) share the same area and digits of the display. For this reason, the two totals will never be visible at the same time, but will always be displayed alternately. K200 METER is programmed to show one or the other of the two totals at very precise times:

- | | |
|---|--|
| 1 | The General Total (Total) is shown during K200 METER standby. |
| 2 | The Resettable Total is shown. |
| 3 | At the end of a Partial reset for a certain time (a few seconds). |
| 4 | During the entire dispensing stage. For a few seconds after the end of dispensing. Once this short time has expired K200 METER switches to standby and lower register display switches to General Total. |

8.1 DISPENSING IN NORMAL MODE

FOREWORD Normal mode is the standard dispensing. While the count is made, the partial and resettable total are displayed at the same time (reset total).

WARNING  **Should one of the keys be accidentally pressed during dispensing, this will have no effect.**

stand by A few seconds after dispensing has ended, on the lower register, the display switches from RESETTABLE TOTAL to GENERAL TOTAL: the word RESET above the word TOTAL disappears, and the RESET TOTAL is replaced by the GENERAL TOTAL. This situation is called STANDBY and remains stable until the user operates the K200 again.



8.1.1 PARTIAL RESET (NORMAL MODE)

1 The partial register can be reset by pressing the reset key when the meter is in standby, meaning when the display screen shows the word "TOTAL".



2 After pressing the reset key, during reset, the display screen first of all shows all the lit-up digits and then all the digits that are not lit up.



3 At the end of the process, a display page is first of all shown with the reset partial and the reset total



and, after a few moments, the reset total is replaced by the non resettable Total.



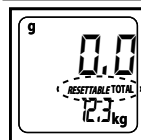
8.1.2 RESETTING THE RESET TOTAL

The reset total resetting operation can only be performed after resetting the partial register. The reset total can in fact be reset by pressing the reset key at length while the display screen shows reset total as on the following display page:

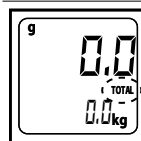


Schematically, the steps to be taken are:

- 1 Wait for the display to show normal standby display page (with total only displayed)
- 2 Press the reset key quickly
- 3 The meter starts to reset the partial
- 4 While the display page showing the reset total is displayed
Press the reset key again for at least 1 second



- 5 The display screen again shows all the segments of the display followed by all the switched-off segments and finally shows the display page where the reset Reset Total is shown.



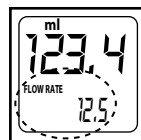
8.2 DISPENSING WITH FLOW RATE MODE DISPLAY

It is possible to dispense fluids, displaying at the same time:

- 1 the dispensed partial
- 2 The Flow Rate in [Partial Unit / minute]
as shown on the following display page:

Procedure for entering this mode:

- 1 wait for the meter to go to Standby, meaning the display screen shows Total only
- 2 quickly press the CAL key
- 3 Start dispensing



The flow rate is updated every 0.7 seconds. Consequently, the display could be relatively unstable at lower flow rates. The higher the flow rate, the more stable the displayed value.

To return to "Normal" mode, press the CAL key again. If one of the two keys RESET or CAL is accidentally pressed during the count, this will have no effect.

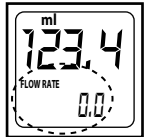
ATTENTION



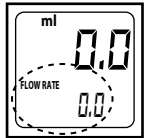
Even though in this mode they are not displayed, both the Reset Total and the General Total (Total) increase. Their value can be checked after dispensing has terminated, returning to "Normal" mode, by quickly pressing CAL.

8.2.1 PARTIAL RESET (FLOW RATE MODE)

To reset the Partial Register, finish dispensing and wait for the meter to show a Flow Rate of 0.0 as indicated in the illustration then quickly press RESET.



Unlike Normal mode, in this case during reset, you do not pass through the stages where the display segments are first lit up and then switched off, but rather the reset partial register is immediately displayed.



9 CALIBRATION

When operating close to extreme use or flow rate conditions (close to minimum or maximum acceptable values), an on-the-spot calibration may be required to suit the real conditions in which the K200 is required to operate.

9.1 DEFINITIONS

CALIBRATION FACTOR OR "K FACTOR"

Multiplication factor applied by the system to the electrical pulses received, to transform these into measured fluid units.

FACTORY K FACTOR

Factory-set default factor. It is equal to 1,000. This calibration factor ensures utmost precision in the following operating conditions:

Fluid: Grease NLGI grade 1

Temperature: 20°C

Flow rate: 0.1-2.5 Kg/min - 0.1-2.8 L/min - 0.2-5.5 lb/min

Even after any changes have been made by the user, the factory k factor can be restored by means of a simple procedure.

USER K FACTOR:

Customized calibration factor, meaning modified by calibration.

9.2 CALIBRATION MODE

Why calibrate?	1	Display the currently used calibration factor;
	2	Return to factory calibration (Factory K Factor) after a previous calibration by the user;
	3	Change the calibration factor using one of the two previously indicated procedures.

FOREWORD Two procedures are available for changing the Calibration Factor:

- 1 In-Field Calibration, performed by means of a dispensing operation;
- 2 Direct Calibration, performed by directly changing the calibration factor.

In calibration mode, the partial and total dispensed quantities indicated on the display screen take on different meanings according to the calibration procedure phase. In calibration mode, the K200 cannot be used for normal dispensing operations. In "Calibration" mode, the totals are not increased.

ATTENTION



The K200 features a non-volatile memory that keeps the data concerning calibration and total dispensed quantity stored for an indefinite time, even in the case of a long power break; after changing the batteries, calibration need not be repeated.

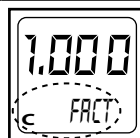
9.2.1 DISPLAY OF CURRENT CALIBRATION FACTOR AND RESTORING FACTORY FACTOR



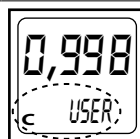
By pressing the CAL key while the appliance is in Standby, the display page appears showing the current calibration factor used. Two cases can occur:

A) If no calibration has ever been performed, or the factory setting has been restored after previous calibrations, the following display page will appear.

The word "Fact" abbreviation for "factory" shows that the factory calibration factor is being used

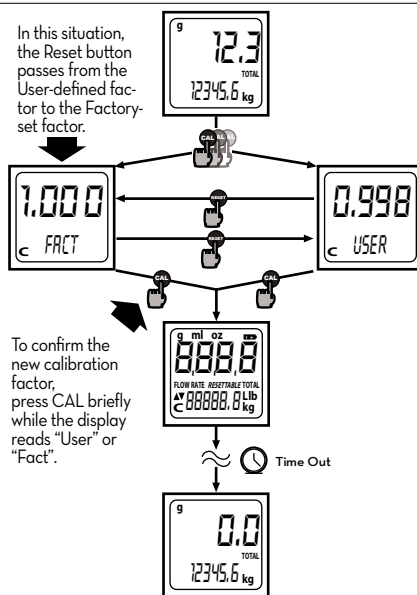


B) If, on the other hand, calibrations have been made by the user, the display page will appear showing the currently used calibration factor (in our example 0,998). The word "user" indicates a calibration factor set by the user is being used





The flow chart alongside shows the switchover logic from one display page to another. In this condition, the Reset key permits switching from User factor to Factory factor. To confirm the choice of calibration factor, quickly press CAL while "User" or "Fact" are displayed. After the restart cycle, the K200 uses the calibration factor that has just been confirmed.



ATTENTION



When the factory factor is confirmed, the old user factor is deleted from the memory.

9.2.2 IN FIELD CALIBRATION

FOREWORD This procedure calls for the fluid to be dispensed into a graduated sample container in real operating conditions (flow rate, viscosity, etc.) requiring maximum precision.

ATTENTION

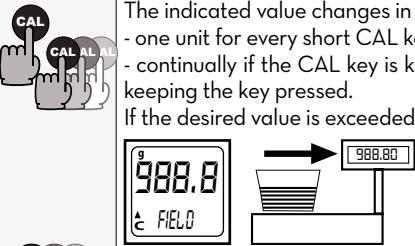
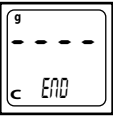


For correct K200 calibration, it is most important to:

- 1 When the Factory Factor is confirmed, the old User factor is deleted from the memory;
- 2 use a precise Sample Container with a capacity of not less than 5 litres, featuring an accurate graduated indicator;
- 3 ensure calibration dispensing is done at a constant flow rate equivalent to that of normal use, until the container is full;
- 4 Not reduce the flow rate to reach the graduated area of the container during the final dispensing stage (the correct method during the final stages of sample container filling consists in making short top-ups at normal operation flow rate);
- 5 after dispensing, wait a few minutes to make sure any air bubbles are eliminated from the sample container; only read the Real value at the end of this stage, during which the level in the container could drop;
- 6 Carefully follow the procedure indicated below.

9.2.2.1 IN-FIELD CALIBRATION PROCEDURE

ACTION		DISPLAY
1	NONE K200 METER in Stand-by	
	LONG CAL KEY KEYING K200 METER enters calibration mode, and the display shows <<C>> and the current calibration factor instead of the partial . The words “Fact” and “USER” indicate which of the two factors (factory or user) is currently in use. Important: This factor is that which the instrument also uses for field calibration measurement operations	
3	LONG RESET KEY KEYING K200 METER displays “FIELD” and the partial at zero: ready for field calibration.	
4	DISPENSING INTO SAMPLE CONTAINER Without pressing any key, start dispensing into the sample container.	
	 Dispensing can be interrupted and started again at will. Continue dispensing until the level of the fluid in the sample container has reached the graduated area. There is no need to reach a preset quantity Indicated value Real value	
5	SHORT RESET KEY KEYING K200 METER is informed that the calibration dispensing operation is finished. Make sure dispensing is correctly finished before performing this operation. To calibrate K200 METER, the value indicated by the partial totaliser (example 9.800) must be forced to the real value marked on the graduated sample container. To do this follow the instructions in sections 6 and 7.	
6	SHORT RESET KEY KEYING Lets you choose the direction of the arrow in the lower left corner of the display. The up arrow increases the factor shown, and the down arrow reduces it . The operation can be repeated to alternate the direction of the arrow.	

7	SHORT/LONG CAL KEY KEYING The indicated value changes in the direction indicated by the arrow - one unit for every short CAL key keying - continually if the CAL key is kept pressed. The speed increase rises by keeping the key pressed. If the desired value is exceeded, repeat the operations from point (6).  Indicated value Real value	
	LONG RESET KEY KEYING K200 METER is informed that the calibration procedure is finished. <u>Before doing this, make sure the DISPLAYED factor is the ACTUAL factor (see previous point 7).</u> K200 METER calculates the new USER K FACTOR ; this calculation could require a few seconds, depending on the correction to be made.	
9	NO OPERATION At the end of the calculation, the new USER K FACTOR is shown for a few seconds, after which the restart cycle is repeated to finally achieve standby condition. IMPORTANT: From now on, the indicated factor will become the calibration factor used by K200 METER and will continue to remain such even after a battery change	
10	NO OPERATION K200 METER stores the new calibration factor and is ready for dispensing, applying the newly defined USER K FACTOR.	

9.2.3 DIRECT MODIFICATION OF K FACTOR

If normal K200 operation shows a mean percentage error, this can be corrected by applying to the currently used calibration factor a correction of the same percentage. In this case, the percentage correction of the USER K FACTOR must be calculated by the operator in the following way:

$$\text{New Cal. Factor} = \text{Old Cal. Factor} * (100 - E\% / 100)$$

EXAMPLE:

Error percentage found: $E\% = 0.9\%$

CURRENT calibration factor: 1.000

New USER K FACTOR: $1.000 * [(100 - (-0.9))/100] = 1.000 * [(100 + 0.9)/100] = 1.009$

If K200 indicates less than the real dispensed value (negative error) the new calibration factor must be higher than the old one as shown in the example. The opposite applies if the Meter shows more than the real dispensed value (positive error).

ACTION		DISPLAY
1	NONE K200 METER in Stand-by.	
	LONG CAL KEY KEYING K200 METER enters calibration mode, and the display shows “C” and the current calibration factor instead of the partial . The words “Fact” and “User” indicate which of the two factors (factory or user) is currently being used.	
	LONG RESET KEY KEYING K200 METER displays “FIELD” and the partial at zero: K200 METER is ready to perform field calibration by dispensing - see previous paragraph.	
	LONG RESET KEY KEYING We now go on to Direct change of the calibration factor: the word “Direct” appears together with the currently used calibration factor. The lower left corner of the display will show an arrow (up or down) that says how the factor will change (increase or decrease) when the following steps 5 or 6 are performed.	
	SHORT RESET KEY KEYING Changes the direction of the arrow. The operation can be repeated to alternate the direction of the arrow.	
	SHORT/LONG CAL KEY KEYING The indicated value changes in the direction indicated by the arrow - one unit for every short CAL key keying - continually if the CAL key is kept pressed. The speed increase rises by keeping the key pressed. If the desired value is exceeded, repeat the operations from point (5).	
	LONG RESET KEY KEYING K200 METER is informed that the calibration procedure is finished. Before performing this operation, make sure the indicated value is that required.	
8	NO OPERATION At the end of the calculation, the new USER K FACTOR is shown for a few seconds, after which the restart cycle is repeated to finally achieve standby condition. IMPORTANT: From now on, the indicated factor will become the calibration factor used by K200 METER and will continue to remain such even after a battery change	
9	NO OPERATION K200 METER stores the new calibration factor and is ready for dispensing, applying the newly edited USER K FACTOR.	

10 MAINTENANCE

FOREWORD

K200 METER has been designed to require a minimum amount of maintenance. The only maintenance jobs required are:

- 1 Battery change - necessary when the batteries have run down;
- 2 Cleaning of the measuring chamber, possibly required for the particular nature of the fats.

WARNING



Maintenance should be performed only by authorised personnel who have read and understood this manual. In order to guarantee the product's functionality, always choose original spare parts when replacing damaged components.

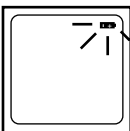
K200 should be installed in a position allowing the batteries to be replaced without removing it from the system.

BATTERY REPLACEMENT

Use 2x1.5 V alkaline batteries size MN9100 LR1 N.

The meter features two low-battery alarm levels:

- 1  When the battery charge falls below the first level on the LCD, the fixed battery symbol appears. In this condition, K200 continues to operate correctly, but the fixed icon warns the user that it is **ADVISABLE** to change the batteries.

- 2  If K200 METER operation continues without changing the batteries, the second battery alarm level will be reached which will prevent operation. In this condition the battery icon starts to flash and is the only one to remain visible on the LCD.

- When replacing the batteries, refer to the figure opposite and to the spare parts list, and proceed as follows:
- 1 Press RESET to update all the totals;
 - 2 Unscrew the battery cap (pos.6);
 - 3 Remove the old batteries;
 - 4 Place the new batteries in the same position as the old ones, making sure the positive pole is positioned as indicated alongside;
 - 5 Re-tighten the battery cap, making sure the seal and tapered spring are correctly positioned;
 - 6 K200 METER will switch on automatically and normal operation can be resumed.

K200 will display the same Reset Total, the same Total and the same Partial indicated before the batteries were changed. After changing the batteries, the meter does not need calibrating again

ATTENTION



Do not discard the old batteries in the environment. Refer to local disposal regulations.

10.1 CLEANING

FOREWORD

It is rarely necessary to clean the measuring chamber; cleaning is quick and easy and you don't need to disconnect K200 METER from the supply line.

ATTENTION



Before opening the measuring chamber, make sure the supply line is not pressurized.

To clean the chamber, proceed as follows (with reference to the spare parts list positions):

Unscrew the four screws that hold the cover (pos.1) and remove the respective washers;

Remove the cover and the cover gasket;

Remove the cover and the cover gasket;

Clean where necessary. For this operation, use a brush or pointed object such as a small screwdriver. Be careful not to damage the body or the gears;

To reassemble the instrument follow the same steps in reverse order, and refer to the figure above to put the gears back correctly.

ATTENTION



Only one gear is equipped with magnets. The gear with the magnets must be installed as shown in the figure above, with the magnets towards K200 METER's body. The other gear (without magnets) must be installed with its major axis at right angles to the first gear. Make sure the gears are turning freely before closing the cover. TIGHTENING TORQUE: 10 Nm.

11 MALFUNCTIONS

PROBLEM	POSSIBLE CAUSE	REMEDIAL ACTION
LCD: NO INDICATIONS	Battery discharged	Check battery and battery contact
NOT ENOUGH MEASUREMENT PRECISION	Meter loses calibration	Check the calibration factor
	Pump sucks in fluid and air	Put the pump in a proper position
	The pump sucks fluid and air	Reposition properly the pump
REDUCED OR ZERO FLOW RATE	Gears blocked	Clean the measurement chamber
K200 METER DOES NOT COUNT, BUT THE FLOW RATE IS CORRECT	Incorrect installation of gears after cleaning	Repeat the reassembly procedure
	Possible electronic board problems	Contact your dealer

12 DISPOSAL

Foreword

If the system needs to be disposed, the parts which make it up must be delivered to companies that specialize in the recycling and disposal of industrial waste and, in particular:

Disposing of packing materials

The packaging consists of biodegradable cardboard which can be delivered to companies for normal recycling of cellulose.

Metal Parts Disposal

Metal parts, whether paint-finished or in stainless steel, can be consigned to scrap metal collectors.

Disposal of electric and electronic components

These must be disposed of by companies that specialize in the disposal of electronic components, in accordance with the indications of directive 2012/19/EU (see text of directive below).



European Directive 2012/19/EU requires that all equipment marked with this symbol on the product and/or packaging not be disposed of together with non-differentiated urban waste. The symbol indicates that this product must not be disposed of together with normal household waste. It is the responsibility of the owner to dispose of these products as well as other electric or electronic equipment by means of the specific refuse collection structures indicated by the government or the local governing authorities.

Information regarding the environment for clients residing within the European Union

Disposing of RAEE equipment as household wastes is strictly forbidden. Such wastes must be disposed of separately.

Any hazardous substances in the electrical and electronic appliances and/or the misuse of such appliances can have potentially serious consequences for the environment and human health.

In case of the unlawful disposal of said wastes, fines will be applicable as defined by the laws in force.

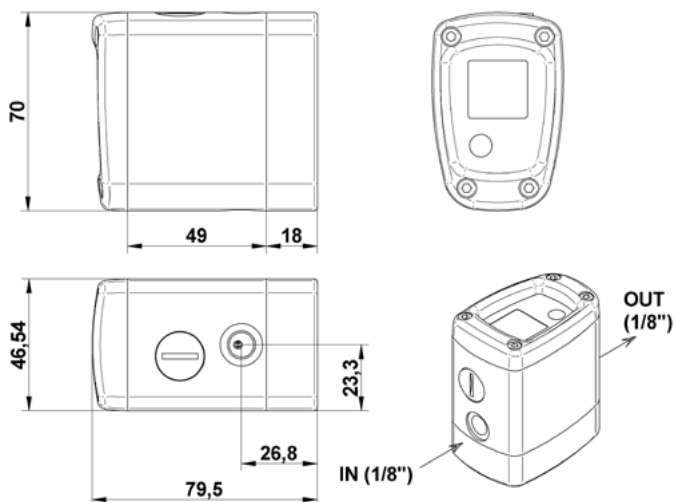
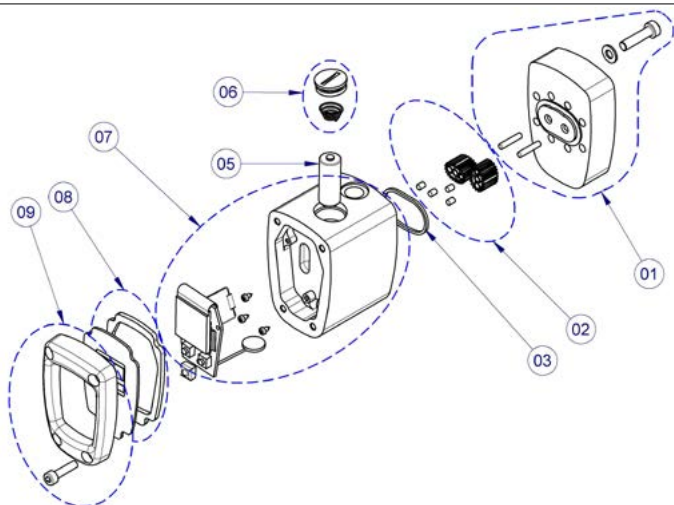
Miscellaneous parts disposal

Other components, such as pipes, rubber gaskets, plastic parts and wires, must be disposed of by companies specialising in the disposal of industrial waste.

13 TECHNICAL DATA

Measurement System	Oval Gear
Resolution (nominal)	0,1 (gr/oz/ml)
Flow rate (Range)	0.1-2.5 Kg/min; 0.1-2.8 L/min; 0.2-5.5 lb/min
Operating Pressure (Max)	550 (Bar) / 8000 (psi)
Bursting pressure (Min)	1000 (Bar) / 15000 (psi)
Storing Temperature (Range)	-20 · + 70 (°C)
Storing Humidity (Max)	95 (% RU)
Operating Temperature (Range)	-10 · + 60 (°C)
Accuracy range	0.1-2.5 Kg/min +/- 3 % after calibration with grease grade NLGI 1 0.1-2.8 L/min 0.2-5.5 lb/min
Repeatability (Typical)	+/- 1 % with fluid grade NLGI 1
Screen	Liquid cristal LCD , featuring: - Partial 4 digit - Resettable total 6 digit - NON resettable total 6 digit
Power Supply	alcaline Batteries 2x1,5V size MN9100 LR1 N
Battery life	18 · 36 months
Weight	0,490 Kg (Batteries included)

14 EXPLODED VIEWS AND OVERALL DIMENSIONS





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