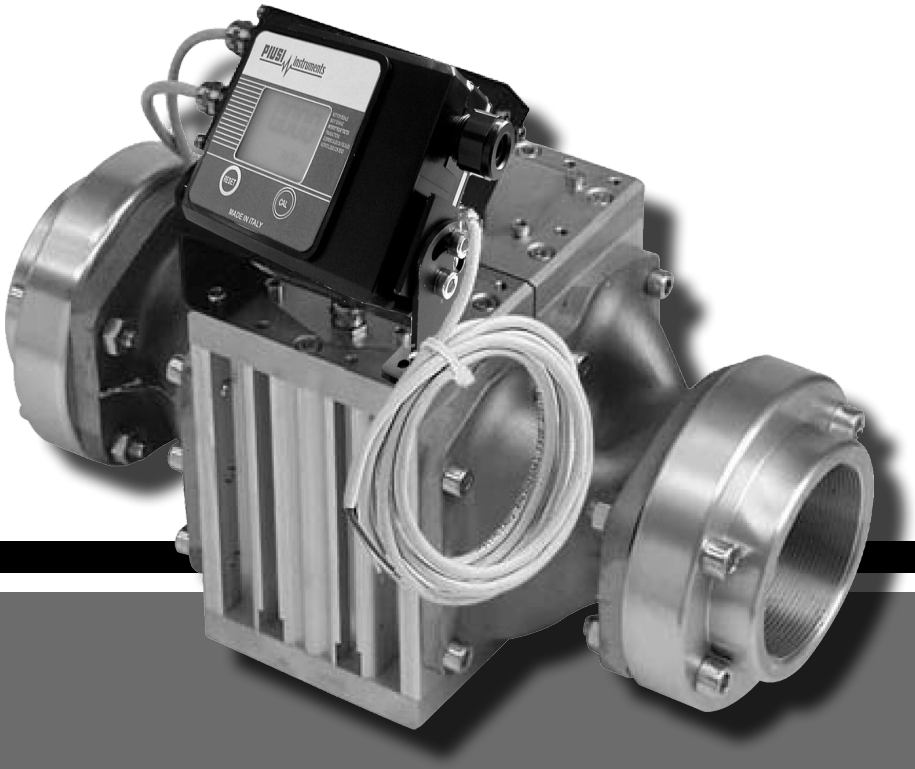
PIUSI

Fluid Handling Innovation

K900



MADE IN ITALY

Manuale di Installazione, uso e calibrazione **IT**

Installation, use and calibration manual **EN**

BULLETIN MO158B ITEN _03

EN

INDEX

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 : METER
Model: K900
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

his 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

3 SAFETY INSTRUCTIONS
3.1 SAFETY WARNINGS

Mains - preliminary checks before installation

Maintenance control

FIRE AND EXPLOSION
When flammable fluids are present in the work area, such as gasoline and windshield wiper fluid, be aware that flammable fumes can ignite or explode.

ELECTRIC SHOCK

Electrocution or death

ATTENTION
You must avoid any contact between the electrical power supply and the fluid that needs to be FILTERED.

Before any checks or maintenance work are carried out, disconnect the power source.

To help prevent fire and explosion:

Use equipment only in will ventilated area.

Keep work area free of debris, including rags and spilled or open containers of solvent and gasoline.

Do not plug or unplug power cords or turn lights on or off when flammable fumes are present.

Ground all equipment in the work area.

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.

This device must be grounded. Improper grounding setup or usage of the system can cause electric shock.

Turn off and disconnect power cord before servicing equipment.

Connect only to a grounded electrical outlets.

Ensure ground prongs are intact on power and extension cords.
Outdoors, use only extensions suitable for the specific use, in accordance with the regulations in force.
The connection between plug and socket must remain away from water.

Never touch the electric plug of socket with wet hands.

Do not turn the device on if the power connection cord or other important parts of the apparatus are damaged, such as the inlet outlet plumbing, dispensing nozzle or safety devices. Replace damaged components before operation.

For safety reasons, we recommend that, in principle, the equipment be used only with a earth-leakage circuit breaker (max 30 mA).

Electrical connections must use ground fault circuit interrupter (GFCI).

Installation operations are carried out with the box open and accessible electrical contacts. All these operations have to be done with the unit isolated from the power supply to prevent electrical shock!

EQUIPMENT MISUSE Misuse can cause death or serious injury		Do not operate the device when fatigued or under the influence of drugs or alcohol.
		Do not leave the work area while device is energized or under pressure.
		Turn off all device when is not in use.
		Do not alter or modify thr device. 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 device.
		Keep children and animals away from work area.
		Comply with all applicable safety regulations.
		Do not exceed the maximum operating pressure or the temperature of the part with lower nominal value of the system. See Technical Data in all equipment manuals.
		Use fluids and solvents that are compatible with the wetted part of the system. See Technical Data in all equipment manuals. Read the manufacturer's instructions of the fluids and solvents. For more information on the material, request the safety data sheet (MSDS) from the distributor or dealer.
		Check the device every day. Immediately repair or replace worn or damaged parts only with original spare parts of the manufacturer.
		Make sure the equipment is classified and approved compliant with the standards of the environment where it is used.
		Use the equipment only for the intended use. Contact your distributor for more information.
		Keep hoses and cables far from traffic areas, sharp edges, moving parts and hot surfaces.
		Do not bend or overbend the hoses or use the hose to pull the device.
TOXIC FLUID OR FUMES HAZARD		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

Contact with the product		In the event of problems developing following EYE/SKIN CONTACT, INHALATION or INGESTION of the treated product, please refer to the SAFETY DATA SHEET of the fluid handled.
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

Wear the following personal protective equipment during handling and installation:
safety shoes;

close-fitting clothing;

protective gloves;

safety goggles;

Protective equipment

instruction manual

3.4 PACKAGING

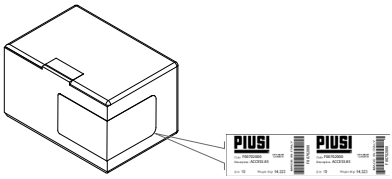
FOREWORD

K900 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.

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.

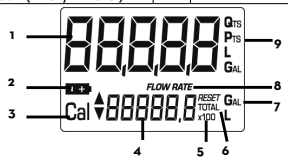
4 BECOMING AQUANINTED WITH K900

FOREWORD	METER is an electronic digital meter featuring an oval-gear measurement system, designed for easy and precise measuring of oils, diesel, rapsoil and antifreeze.
FUNCTIONING PRINCIPLE	The fluid, by flowing through the appliance, rotates the gears which, during their rotation, transfer, "volume units" of fluid. The exact measurement of the dispensed fluid is done by counting the number of rotations made by the gears and consequently the number of transferred "volume units". The magnetic coupling, between the magnets installed in 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.
OPERATIONAL MODE	In the dispensing mode (Normal Mode), the partial and the total amounts are shown in two different registers of the LCD.
	The METER features a non-volatile memory for storing the dispensing data, even in the event of a complete power break for long periods.

4.1 LCD DISPLAY (ONLY METER VERSION)

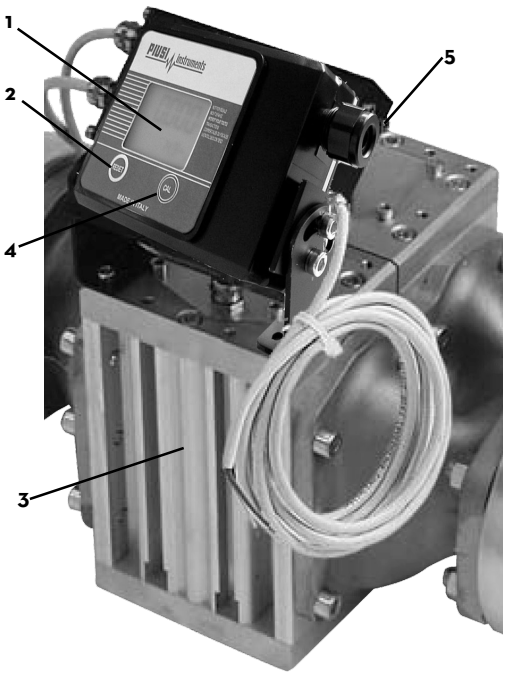
FOREWORD	The "LCD" of the METER features two numerical registers and various indications displayed to the user only when the applicable function so requires.

1	Partial register (5 figures with moving comma FROM 0.1 to 99999) indicating the volume dispensed since the reset button was last pressed	**6**	Indication of type of total, (TOTAL / Reset TOTAL);
2	Indication of battery charge	**7**	Indication of unit of measurement of Totals: L=Litres Gal=Gallons
3	Indication of calibration mode	**8**	Indication of Flow Rate mode
4	Totals register (6 figures with moving comma FROM 0.1 to 999999), that can indicate two types of Total: 4.1. General Total that cannot be reset (TOTAL) 4.2. Resettable total (Reset TOTAL)	**9**	Indication of unit of measurement of Partial: Qts=Quarts Pts=Pints L=Litres Gal=Gallons
5	Indication of total multiplication factor (x10 / x100)		



Measurement Chamber	The measurement chamber of K900 consists of two chambers held together by the manifold. Inside the measurement chamber are the oval gears which, on turning, generate electrical pulses which are processed by the microprocessor-controlled electronic board. By applying a suitable calibration factor (meaning a "weight" associated with each pulse), the microprocessor translates the pulses generated by the "fluid volume" rotation expressed in the set units of measurement, displayed on the partial and total registers of the LCD. All the meters are factory set with a calibration factor called FACTORY K FACTOR equal to 1,000. For best meter performance the instrument can be "calibrated". It is possible to return to factory calibration at any time.
Battery Housing	K900 is powered by two standard type 1.5 V batteries (size 1N) . The battery housing is closed by a threaded watertight cap that can be easily removed for quick battery change.

K900 components	
1	LCD display
2	RESET button
3	Measurement chamber
4	CAL button
5	Battery housing



4.2 USERS BUTTONS

FOREWORD	The METER features two buttons (RESET and CAL) which individually perform two main functions and, together, other secondary functions.
MAIN FUNCTIONS PERFORMED	- for the RESET key, resetting the partial register and Reset Total - for the CAL key, entering instrument calibration mode
SECONDARY FUNCTIONS	Used together, the two keys permit entering configuration mode where the desired unit of measurement can be set.
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** 

5 INSTALLATION

FOREWORD

K900 has a 3 inch inlet and outlet. It was designed for permanent installation on a distribution line and to this purpose, the measurement chamber is fitted with a threaded inlet and outlet.
The two cables (each one consisting of two wires) sticking out from the cover of the measurement chamber are to be connected to K900 remote display.

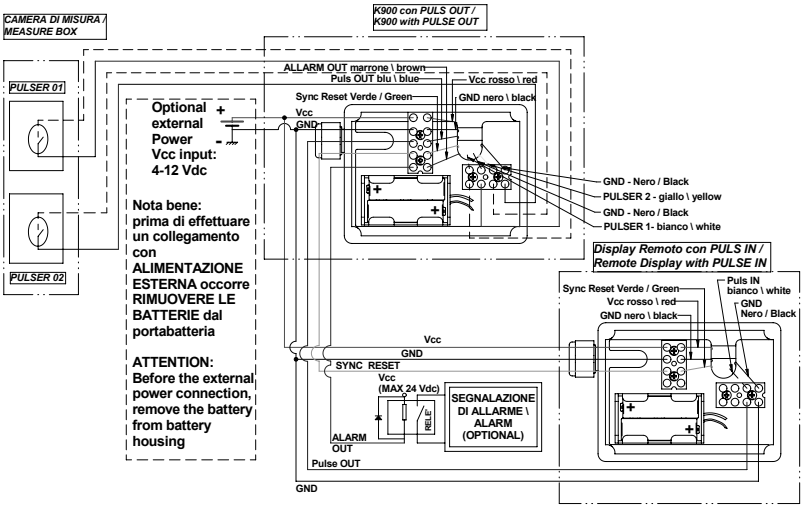
WARNING

The position of the filter determines the input direction of the flow.
The pulser must be connected by two wires observing the electrical specifications shown in the diagram

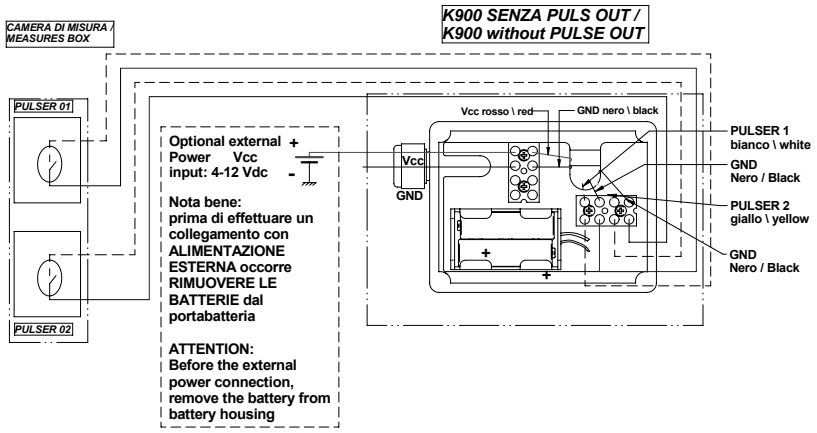
Make sure a filter with adequate filtering capacity is always fitted either at meter inlet or at the entrance of the line on which the meter is fitted. If solid particles enter the measurement chamber, the gears could seize.

On installations, place the meter in a position that will enable an easy access to the batteries compartment

SCHEMA COLLEGAMENTI ELETTRICI / ELECTRICAL CONNECTION



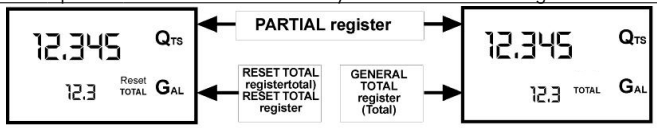
SCHEMA COLLEGAMENTI ELETTRICI / ELECTRICAL CONNECTION



6 DAILY USE

FOREWORD The only operations that need to be done for daily use are partial and/or resettable total register resetting. The user should use only the dispensing system of K900. Occasionally the meter may need to be configured or calibrated. To do so, please refer to the relevant chapters.

Below are the two typical normal operation displays. One display page shows the partial and reset 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 in factory set and cannot be changed.



- The Partial register positioned in the top part of the display indicates the quantity dispensed since the RESET key was last pressed
- The RESET Total register, positioned in the lower part of the display, indicates the quantity dispensed since the last RESET Total resetting. The RESET Total cannot be reset until the Partial has been reset, while vice versa, the Partial can always be reset without resetting the RESET Total. The unit of measurement of the two Totals can be the same as the Partial or else different according to the factory or user settings.
- The General TOTAL register (Total) can never be reset by the user. It continues to rise for the entire operating life of the meter.
- The register of the two totals (Reset 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.
- The General Total (Total) is shown during Meter standby
- The Reset Total is shown:

- At the end of a Partial reset for a certain time (a few seconds)
- During the entire dispensing stage
- For a few seconds after the end of dispensing. Once this short time has expired. Meter switches to standby and lower register display switches to General Total

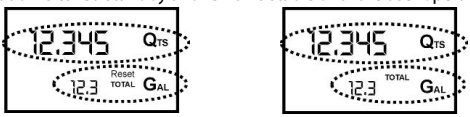
NOTE **6 digits are available for Totals, plus two icons x 10 / x100. The increment sequence is the following:**
0.0 -› 99999.9 -› 999999 -› 100000 x 10 -› 999999 x 10 -›100000 x 100 -› 999999 x 100

6.1 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.

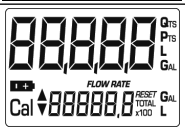
stand by A few seconds after dispensing has ended, on the lower register, the display switches from resettable total to general total: the word reset above the word total disappears, and the reset total is replaced by the general total.
This situation is called standby and remains stable until the user operates the K400 again.



6.1.1 PARTIAL RESET (NORMAL MODE)

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".

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.



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 resettableTotal.

6.2 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)

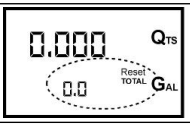
2 Press the reset key quickly

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.



7 ERROR INDICATIONS

FOREWORD

During the normal meter operation, unusual conditions may occur and compromise its proper functioning. K900 electronics was designed to recognize one of these conditions and inform the operator by means of a display message. In these cases, an error indication will be displayed instead of the total; the partial indication continues to increase while blinking.
The unusual working conditions recognized by the meter are the following:

Exceeding of the maximum meter flow rate

he flow rate of the fluid dispensed may exceed the max. allowed flow rate, thus damaging the meter gears. Should this condition occur, "HI FLO" will be displayed:

From one of the measurement chambers no pulses are found

The meter consists of two adjacent measurement chambers, held together by a manifold. The fluid, by flowing through the appliance, rotates the gears in the two chambers which, during their rotation, transfer, "volume units" of fluid. The exact measurement of the dispensed fluid is done by counting the number of rotations made by the gears in both chambers and consequently counting the transferred "volume units".
Each chamber is associated with a transmission channel of "volume units".

- chamber 1 channel 1 (CH1 WHITE wire)

- chamber 2 channel 2 (CH2 YELLOW wire).

Should the gears of one of the two chambers block or the counting electronics of one of the two chambers break down, counting of the dispensed quantity would not be correct.
To make the user aware of this fault, "E1" is displayed:

"E1 CH1" means that "channel 1 has stopped": in chamber 1 no fluid is passing because the gears are blocked or the electronics is faulty;

"E1 CH2" means that "channel 2 has stopped": in chamber 2 no fluid is passing because the gears are blocked or the electronics is faulty.

In one measuring chamber more fluid is passing than in the other

If the gears of one chamber are slightly obstructed, they slow down the transfer of fluid which, in the other chamber, will flow more quickly. In this conditions it will be displayed:

"E2 CH1": fluid in chamber 1 is slower than fluid in chamber 2	CHECK GEARS OF CHAMBER 1.
"E2 CH2": fluid in chamber 2 is slower than fluid in chamber 1	CHECK GEARS OF CHAMBER 2.

8 CALIBRATION

FOREWORD

K900 is supplied with a factory calibration that ensures precise measuring in most operating conditions. Nevertheless, when operating close to extreme conditions, such as for instance:

* with fluids close to acceptable range extremes (such as low-viscosity antifreeze)
* in extreme flow rate conditions (close to minimum or maximum acceptable values)

8.1 DEFINITIONS

Calibration factor or "K Factor"

this is the 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	**DIESEL (EN590)**
Temperature:	**20°C**
Flow rate:	**50-255 litres/min**

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

K900 is also compatible with HVO / XTL paraffinic: EN 15940

User K Factor

Customized calibration factor, meaning modified by calibration.

8.2 CALIBRATION PROCEDURE

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 meter cannot be used for normal dispensing operations. In "Calibration" mode, the totals are not increased

ATTENTION

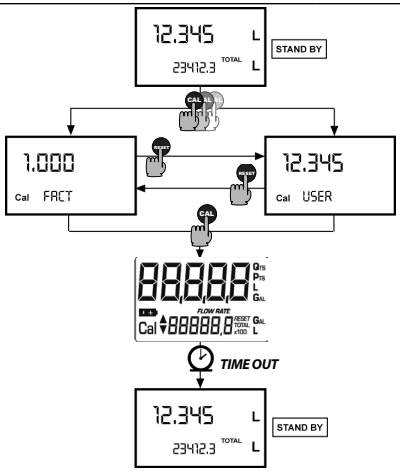
The meter features a non-volatile memory that keeps the data concerning calibration and total dispensed quantity stored for an indefinite time, even in the case of a long power break; after changing the batteries, calibration need not be repeated.

8.2.1DISPLAY 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. 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

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 K400 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

EN

8.2.2 IN FIELD CALIBRATION

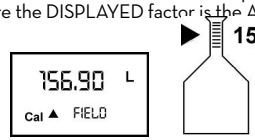
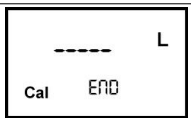
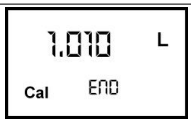
FOREWORD This procedure calls for the fluid to be dispensed into a graduated sample container in real operating conditions (flow rate, viscosity, etc.) requiring maximum precision.

ATTENTION **For correct K400 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.

8.2.2.1 IN-FIELD CALIBRATION PROCEDURE

	OPERATION		Display
1	**NONE** K900 in normal mode, not in counting mode.		1234.5 13456 TOTAL
2	**LONG CAL KEY KEYING** K900 enters calibration mode, shows «CAL" and displays the calibration factor in use instead of total. The words "Fact" and "USER" indicate which of the two factors (factory or user) is currently in use		1.000 Cal FACT (USER)
3	**LONG RESET KEY KEYING** K900 shows "CAL" and the partial at zero. The meter is ready to perform in-field calibration.		0.000 L Cal FIELD
4	**DISPENSING INTO SAMPLE CONTAINER** Without pressing any button, start dispensing into the sample container.		155.20 L Cal FIELD
	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	**5 SHORT RESET KEY KEYING** K900 is informed that the calibration dispensing operation is finished. Make sure dispensing is correctly finished before performing this operation. To calibrate K900, the value indicated by the partial totaliser (example 155.20) must be forced to the real value marked on the graduated sample container. In the bottom left part of the display an arrow appears (upwards and downwards), that shows the direction (increase or decrease) of the USER K FACTOR value change when the operations 6 or 7 are performed.	
6	**SHORT RESET KEY KEYING** Changes the direction of the arrow. The operation can be repeated as many times as you wish	
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. (for the first 5 units slowly and then quickly). If the desired value is exceeded, repeat the operations from point (6).	
8	**LONG RESET KEY KEYING** K900 is informed that the calibration procedure is finished. Before doing this, make sure the DISPLAYED factor is the ACTUAL factor  Indicated value Real value K900 calculates the new USER K FACTOR ; this calculation could require a few seconds, depending on the correction to be made. During this operation the arrow disappears but the CAL indication remains. If this operation is performed after operation (5), without changing the indicated value, the USER K FACTOR would be the same as the FACTORY K FACTOR, thus it is ignored.	
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 the meter and will continue to remain such even after a battery change***	
10	**NO OPERATION** K900 stores the new calibration factor and is ready for dispensing, applying the newly defined USER K FACTOR.	

8.2.3 DIRECT MODIFICATION OF K FACTOR

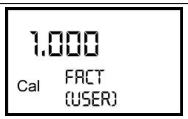
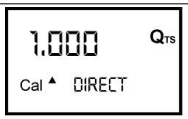
This procedure is especially useful to correct a "mean error" obtainable on the basis of several performed dispensing operations. If normal K900 operation shows a mean percentage error, this can be corrected by applying to the currently used calibration factor a correction of the same percentage. In this case, the percentage correction of the USER K FACTOR must be calculated by the operator in the following way:

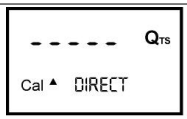
$$\text{New cal. factor} = \text{Old cal. factor} * \left(\frac{100 - E\%}{100} \right)$$

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 the meter 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).

	OPERATION	Display Connfiguration
1	**NONE** K900 in normal mode, not in counting mode	
2	**LONG CAL KEY KEYING** K900 enters calibration mode, shows "CAL" and displays the calibration factor being used instead of the partial. The words "Fact" and "User" indicate which of the two factors (factory or user) is currently being us	
3	**LONG RESET KEY KEYING** K900 shows "CAL" and the partial at zero. K900 is ready to perform in-field calibration by dispensing	
4	**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. In the bottom left part of the display, an arrow appears (upwards or downwards) defining the direction (increase or decrease) of change of the displayed value when subsequent operations 5 or 6 are performed	
5	**SHORT RESET KEY KEYING** Changes the direction of the arrow. The operation can be repeated to alternate the direction of the arrow.	
6	**BSHORT/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).	

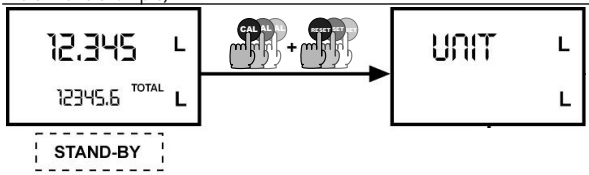
7	**LONG RESET KEY KEYING** K900 is informed that the calibration procedure is finished. Before performing this operation, make sure the indicated value is that required	
8	**NO OPERATION** At the end of the calculation, the new USER K FACTOR is shown for a few seconds, after which the restart cycle is repeated to finally achieve standby condition. IMPORTANT: From now on, the indicated factor will become the calibration factor used by the meter and will continue to remain such even after a battery change	
9	**NO OPERATION** K900 stores the new calibration factor and is ready for dispensing, applying the newly defined USER K FACTOR.	

9 CONFIGURATION

K900 has a menu with which the user can configure the machine in accordance with his/her requirements.
To enter the configuration menu, proceed as follows:

1 wait until K900 is in Stand-by

2 press the CAL and RESET buttons at the same time and hold them down until the word "Unit" and the previously-set unit of measurement appear on the display (Litre/Litre in this example)



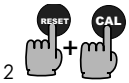
9.1 CONFIGURATION OF THE UNITS OF MEASUREMENT

The METER feature a menu with which the user can select the main measurement unit, Quarts (Qts), Pints (Pts), Litres (Lit), Gallons (Gal); he combination of the unit of measurement of the Partial register and that of the Totals is predefined according to the following table:

Combination no.	Unit of Measurement Partial Register	Unit of Measurement Totals Register
1	Litres (L)	Litres (L)
2	Gallons (Gal)	Gallons (Gal)
3	Quarts (Qts)	Gallons (Gal)
4	Pints (Pts)	Gallons (Gal)

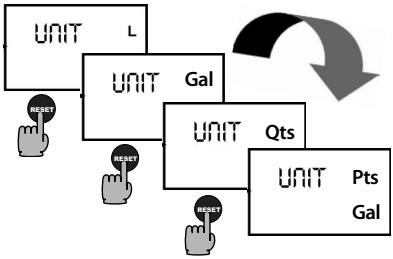
To choose between the 4 available combinations:

1 Wait for the METER to go to Standby



2 Then press the CAL and RESET keys together. Keep these pressed until the word "UNIT" appears on the screen together with the unit of measurement set at that time (in this example Litres / Litres)

3 Every short press of the RESET key, the various combinations of the units of measurements are scrolled as shown below:



4 By pressing the CAL key at length, the new settings will be stored, the METER will pass through the start cycle and will then be ready to dispense in the set units.

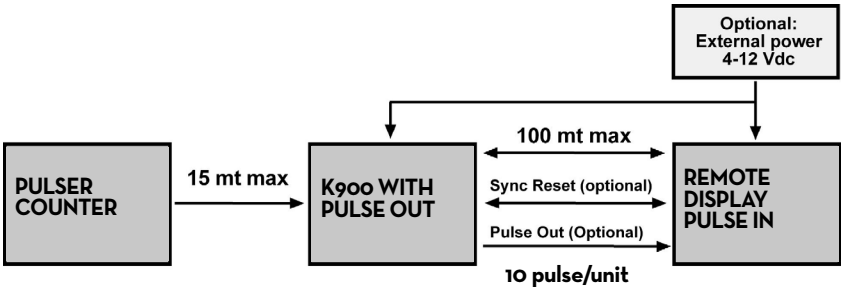
ATTENTION

The Reset Total and Total registers will be automatically changed to the new unit of measurement.

NO new calibration is required after changing the Unit of Measurement.

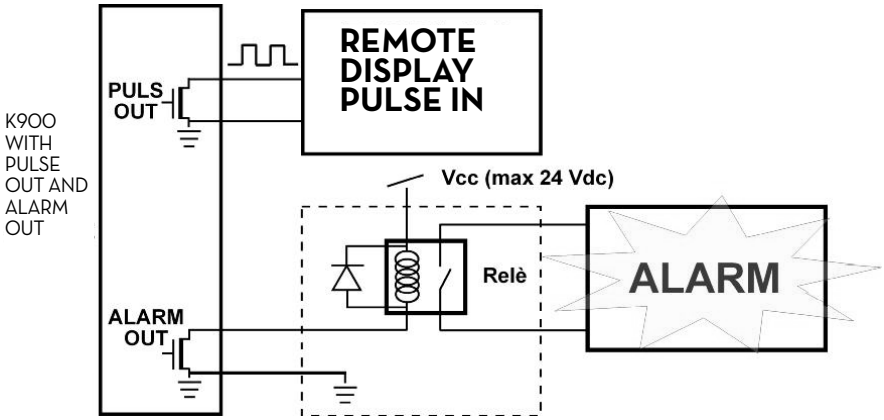
9.2 (OPTIONAL) PULSE TRANSMITTER (PULS OUT)

For the models in which the function is available, there is an "Open Collector" type "Puls Out" output, which emits 10 impulses per Unit of Measurement of the partial quantity that is dispensed. The number of pulses per unit is fixed and it is set to 10 p\unit.
By connecting the Puls OUT output to a Display Repeater ("Puls IN Remote Display) and connecting the "Sync reset" output (see logical connection shown below) it is possible to synchronise the 2 counters in measurement as well as in reset.



10 ALARM OUTPUT (ALARM OUT)

Nei modelli che prevedono l'uscita Puls Out, è disponibile anche un'uscita "Alarm Out", del tipo "Open Collector", che si attiva quando si verifica una condizione di errore. L'uscita "Alarm Out" può essere collegata ad un relè per pilotare una segnalazione di errore remota. Tale collegamento è opzionale, quindi è possibile utilizzare l'uscita Puls Out senza dover necessariamente usare anche l'uscita Allarme.



11 MAINTENANCE
11.1 CHANGE BATTERY

FOREWORD

The METER has been designed to require a minimum amount of maintenance. The only maintenance jobs required are:
- Battery change – necessary when the batteries have run down
- Cleaning the measurement chamber. This may be necessary due to the particular nature of the dispensed fluids or due to the presence of solid particles following bad filtering

BATTERY REPLACEMENT

Use 2x1.5 V alkaline batteries size AAA

WARNING

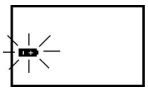
K400 should be installed in a position allowing the batteries to be replaced without removing it from the system.

K400 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, K400 continues to operate correctly, but the fixed icon warns the user that it is ADVISABLE to change the batteries.

2



If K400 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.

o change the batteries, with reference to the exploded diagram positions, proceed as follows

1	Press RESET to update all the totals
2	Loosen the 4 fixing screws of the lower cover
3	Remove the old batteries
4	Place the new batteries in the same position of the old ones, being sure that the positive pole is positioned as shown on the rubber protection (pos. 7)
5	close the cover again, by positioning the rubber protection as a gasket
6	K400 will switch on automatically and normal operation can be resumed

The ***METER*** 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.

EN

11.2 CLEANING THE MEASUREMENT CHAMBERS

FOREWORD K900 measurement chamber can be cleaned without removing the instrument from the line or from the dispensing nozzle on which it is fitted.

ATTENTION **Always make sure that the liquid has drained from the meter before cleaning.**

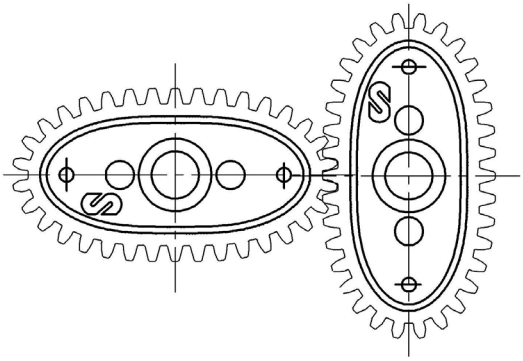
CLEANING To clean the chamber proceed as follows:

1. Loosen the four cover retention screws
2. Remove the cover and the gasket
3. Remove the oval gears
4. Clean where necessary. For this operation, use a brush or pointed object such as a small screwdriver.
5. Be careful not to damage the body or the gears
6. To reassemble the instrument, perform the operations in the opposite sequence.

ATTENTION **Only of the two gears, modularly coupled as shown in the diagram above, features magnets. The gear with magnets must be positioned as indicated in the picture. The second gear (without magnets) must be installed with its major axis at right angles to the first gear**

WARNING **Fit the second gear (without magnets) with axis greater than 90° compared to the first gear, and with the holes visible from the cover side**

Make sure the gears are turning freely before closing the cover.



11.3 CLEANING THE FILTER

FOREWORD K900 filter can be cleaned without removing the instrument from the line on which it is fitted.

ATTENTION **Make sure the liquid has been drained from the meter before cleaning.**

To clean the filter proceed as follows:

1. Unscrew the 4 + 4 sealing screws on the lower covers
2. Remove the covers and gaskets
3. Slide out the filters
4. Clean the filters with compressed air
5. Carry out the reverse procedure to reassemble the filter.

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/UE (see text of directive below).
	European Directive 2012/19/UE 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.

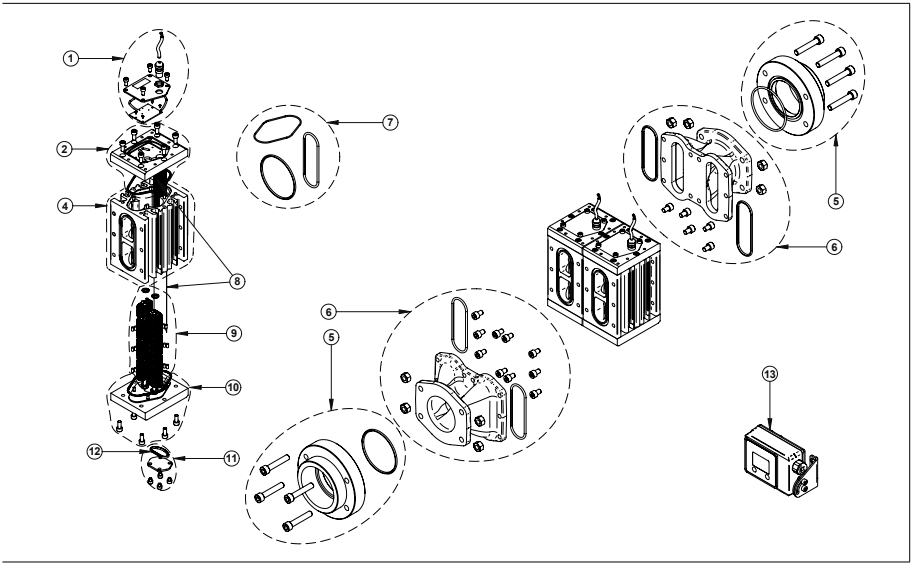
13 MALFUNCTIONS

Problem	Possible Cause	Remedial Action
LCD: BLINKING battery icon	Battery low	Replace batteries
Not enough measurement precision	Wrong K FACTOR	Referring to section C, check the calibration factor
	Il contalitri funziona sotto la minima portata accettabile.	The meter works below minimum acceptable flow rate
The 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
High loss of head	Dirty filter	Clean the filters
	Braked gears	Clean the measurement chambers
LCD: "HI FLO" is displayed	The meter is exceeding the maximum allowed flow rate	Decrease the flow rate
LCD: "E1 CH1" is displayed	In chamber 1 no fluid is passing because gears are blocked.	Check gears in chamber 1
	Possible electronic board problems	Contact your dealer
LCD: "E1 CH2" is displayed"	In chamber 2 no fluid is passing because gears are blocked.	Check gears in chamber 2
	Possible electronic board problems	Contact your dealer
LCD: "E2 CH1" is displayed	fluid in chamber 2 is slower than fluid in chamber 1	Check gears chamber 1
LCD: "E2 CH2" is displayed	fluid in chamber 2 is slower than fluid in chamber 1	Check gears chamber 2

14 TECHNICAL SPECIFICATIONS

Measurement system		Oval gears
Resolution	(nominal)	0,070 (Litres/pulse) - 0.018 (gal/pulse)
Flow Rate	(Range)	50 · 500 (Litres/minute) - 13 · 132 (gal/min)
Operating pressure	(Max)	20 (Bar) - 290 (psi)
Bursting pressure	(Min)	40 (Bar) - 580 (psi)
Storage temperature	(Range)	-20 · + 70 (°C) - -4 +158 (°F)
Storage humidity	(Max)	95 (% RU)
Operating temperature	(Max)	60 (°C) - 140 (°F)
Flow resistance	At 255 l/min (67.3 gal/min) with diesel at 20°C	+/- 1.3 (Bar) - 18.8 (psi)
Viscosity	(Range)	between 2 and 5.35 cSt
Accuracy	(between 50 and 500 l/min)	+/- 0.5% of value indicated after calibration
Reproducibility	(Typical)	+/- 0,2 (%)
Screen	Liquid crystals LCD Featuring: - 5-figure partial - 6-figure Reset Total plus x10 / x100 6-figure non reset Total plus x10 / x100	
Battery power	2x1.5 V alkaline batteries size 1N	
External Power	4 · 12 Vdc	
Battery life	18 · 36 months	
Weight	12.5 kg - 27.5 (lbs) (including batteries)	

15 EXPLODED VIEW
15 VISTA ESPLOSA



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