7 CUSTOMIZING THE METER

Customizing the METER means using the options offered by the METER to guarantee an easy, handy and accurate use.
METER customization can be carried out by the Manager using the **Customization Menu** which gives access to the following customization **options**.
Setting the most frequently used **PRESET VALUES**.
• Selecting the **Unit of measurement**.
• Selecting the **Number of Decimal Digits**.
• Activating the **Auto RESET** function.
• Modifying the **Precision Stop Factor (PS** Factor).
Modifying the **Calibration factor (K** Factor).

(• = Not available on all models)

7.1 CUSTOMIZING MENU

To access the various customizing functions and select the desired options, **two different actions are possible on the keys:**

- This symbol indicates the necessity **to press the key briefly** with consequent release.
- This symbol indicates the necessity **to press and keep pressed the key** for a few seconds.

To exit the customization menu, independently from the activity in progress, **press RESET**.
The currently displayed settings become immediately operational.

- **To access the customization menu:**

If the METER is off, press RESET to restart it.
The METER will display:

If the METER displays the **Resettable TOTAL**, wait for a few seconds until the METER automatically displays the **TOTAL**.

Only in this condition it is possible to enter the customization Menu.
Simultaneously press AUTO and RESET keys and keep them pressed until the METER displays:

You have now entered the following activity: **Setting the most frequently used PRESET values.**
See paragraph 7.2 for setting mode.
To access the subsequent activity:
Press and keep the AUTO key pressed until
The METER displays:

Setting the most frequently used PRESET values.

You have now entered the following activity: **Selecting the Unit of Measurement.**
See paragraph 7.3 for setting modes.
To access the subsequent activity:
Press and keep the AUTO key pressed until the METER displays:

Selecting the Unit of Measurement

You have now entered the following activity: **Selecting the Number of Decimal Digits.**
See paragraph 7.4 for setting modes.
To access the subsequent activity:
Press and keep the AUTO key pressed until the METER displays:

Selecting the Number of Decimal Digits

You have now entered the following activity: **Activating the Auto RESET function.**
See paragraph 7.5 for activation mode.
To access the subsequent activity:
Press and keep the AUTO key pressed until the METER displays:

Activating the Auto RESET function.

You have now entered the following activity: **Modifying the Precision Stop Factor (PS factor).**
See paragraph 7.6 for modification mode.
To access the subsequent activity:
Press and keep the AUTO key pressed until the METER displays:

Modifying the Precision Stop Factor (PS factor)

You have now entered the following activity: **Modifying the Calibration Factor (K factor).**
See paragraph 7.7 for modification mode.

Modifying the Calibration Factor (K factor)

To exit the customization mode, independently from the activity in progress, press RESET. **The currently displayed settings become immediately operational.**

7.2 FREQUENTLY USED PRESET VALUES

The METER allows the operator to store 5 different **most frequently used PRESET values** (AUTO1 ... AUTO5) which can be quickly recalled without having to set them each time by means of the numeric keys.

The first time this activity is accessed, **all the PRESET values stored** (AUTO1 ... AUTO5) are set to zero.

When the METER displays:

Index of the PRESET value AUTO1

Use the numeric keys to set a new PRESET value (which will replace the value previously stored in memory). If for example it must be assigned the value 31.2 to AUTO1 press:

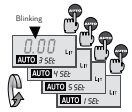
The METER displays:

By keeping the keys pressed, the value continues to vary.

To modify or check the next most frequently used PRESET value, press the AUTO key; the METER will display:

Index of the PRESET value AUTO2

and is ready to accept the setting of the PRESET value AUTO2. Each time the AUTO key is pressed, the next AUTO value is displayed.



Press AUTO and keep it pressed to **access** the next activity.

Press RESET to **exit** the customization menu.

7.3 UNIT OF MEASUREMENT

The METER allows the user to select one of the following Units of Measurement:
- QTS = QUARTS
- PTS = PINTS
- LIT = LITERS
- GAL = GALLONS (U.S. Gallon).

The above-mentioned Units of Measurements refer to the **Batch** total indication.

- If the LITERS unit is selected: **The TOTALS are expressed in LITERS.**
- If the GALLONS, PINTS or QUARTS unit is selected: **The TOTALS are expressed in GALLONS.**

When the METER displays:

Press AUTO to go to the next Unit of Measurement.
Keep on pressing AUTO until the desired Unit of Measurement is displayed.

Press AUTO and keep it pressed to **go** to the next activity.

Press RESET to **exit** the customization menu.

- The modification of the unit of measurement does **NOT** require a new Calibration (see paragraph 7.7).
- If the TOTAL indicates a value other than zero, this value is **automatically converted** from LITERS into GALLONS o viceversa, if necessary, when the Unit of Measurement is being modified.

7.4 DECIMAL DIGITS

The METER allows the user to select the number of Decimal Digits by displaying the HUNDREDTH (two decimal digits) or the THOUSANDTH (three decimal digits) of the selected Unit.
The METER displays:

Press AUTO to modify the selection.
The METER displays:

Press AUTO again to return to the previous selection.

The METER displays the FLOATING POINT Batch total dispensed.
Independently from the selection performed (two or three decimal digits):
- as soon as the amount dispensed
- exceeds 10 units, the METER displays two decimal digits only;
- as soon as the amount dispensed exceeds 99 Units, the METER displays one decimal digit only.

Press AUTO and keep it pressed to **access** the next activity.

Press RESET to **exit** the customization menu.

7.5 AUTO RESET

The METER is equipped with an Auto RESET function.
When the function is activated, a few minutes after the end of a dispensing operation, the METER automatically resets the Batch Total.
When the METER displays:

Press AUTO to modify the selection.

Press AUTO again to return to the previous selection.

Independently from the selection carried out, **the Batch Total supplied is never reset of the dispensing operation has been performed in AUTO mode.**

Press AUTO and keep it pressed to **access** the next activity.

Press RESET to **exit** the customization menu.

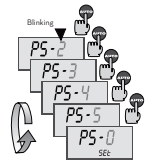
7.6 STOP PRECISION IN AUTO MODE

The function described in this paragraph only **concerns those operators who want to obtain the maximum dispensing stop precision** in AUTO mode. If a slight excess of the preset value (a few hundredths of litres) does not cause any problem, the present paragraph can be ignored.
The METER, in AUTO mode, allows the user to obtain a high precision stop, thus dispensing exactly the preset amount without exceeding the PRESET value.
To guarantee this hgh stop precision, **especially when the unit operates at the maximum allowed flow-rates**, the valve does not close when the PRESET value is reached, **but when the dispensed amount is lower than the PRESET value by a few Unit hundredths.** To guarantee the dispensing stop precision, **this pre-stop value must not be fixed**, but strictly dependent on the flow-rate used. To allow the Manager to obtain the highest stop precision, the unit has been equipped with a Stop Precision Factor (Precision Stop) called **PS factor**. The Manager, during the METER customization, **can select a PS Factor ranging between ZERO and FIVE.** By selecting **PS = 0** a pre-closing equal to **ZERO** is set; by selecting **PS = 5** the **MAXIMUM** pre-closing is set.

The higher the flow rate, the higher the selected PS value must be. Selecting a too high PS value, the dispensed amount may be lower than the preset value by some hundredts of a litre.
When the METER displays:

Press AUTO to increase the PS Factor by one unit.

Keep on pressing AUTO until the desired PS factor value is displayed.



Press AUTO and keep it pressed to **access** the next activity.

Press RESET to **exit** the customization menu.

7.7 CALIBRATING

The METER is equipped with a liter-counter high precision oval gears, factory pre-calibrated.
If the METER is used:
- **with fluids having a viscosity close to the limits of the allowed range** (such as low viscosity antifreeze fluids or high viscosity oils for gear boxes)
- in extreme flow-rate conditions (close to the min. and max. values of the allowed range) **it may be necessary to carry out an on-site calibration.**

Why calibrate?

How to calibrate

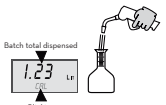
The METER allows the user to carry out a fast and accurate electronic calibration by modifying the **Calibration factor (K Factor).**
At delivery, all METERS are given the same calibration factor:
K Factor = 1.000
This calibration factor guarantees the best accuracy in the following conditions:
- Fluid: **motor oil type 10W 30.**
- Temperature: **20°C.**
- Flow-rate: **10 liter/min.**

The calibration can be done either as:
- An on-site calibration, by dispensing into a calibrated container;
- A direct modification of the calibration factor.

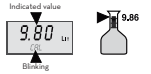
When the METER displays:

On-site calibration by dispensing into a calibrated container

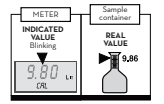
press the AUTO key; it is possible to start the calibration by dispensing the fluid into a calibrated container.
During dispensing the METER displays:



The dispensing operation may be freely interrupted and resumed.
The Calibration dispensing is finished when the fluid level reaches the graduated area in the calibrated container.



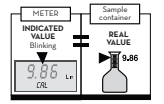
To obtain a correct METER calibration, it is necessary to use an accurate sample container having a **capacity not less than 5 liters.**
Completely purge all air from the unit (see par. 5.7) before performing the calibration.
Perform the calibration dispensing at a steady flow-rate, by pulling the trigger fully down and keeping it in open position until the container is full.
During the final dispensing phase, do not reduce the flow-rate to reach the graduated area in the calibrated container.
The correct technique to be adopted at the final stages of the filling operations into the calibrated container is "small topping-ups"; this is achieved by rapidly pulling the
METER trigger fully down and then releasing it very quickly.
Press AUTO to confirm the end of the calibration dispensing.



After dispensing, wait for a few minutes to allow any possible air bubble to be bled from the sample container. Read the Real value only at the end of this phase as the level may decrease in the container.
Do not wait for more than 15 minutes as the METER will exit the menu and it will be no longer possible to complete the calibration procedure.
The METER is ready to accept the modification of the **indicated value** to be matched with the **real value**.

Press the "+" key to increase the indicated value.
Press the "-" key to decrease the indicated value.

Each time a key is pressed, the last digit on the right is modified by one unit.
By keeping the keys pressed, the value changes, slowly at first and then rapidly.



Press AUTO to confirm the end of the indicated value correction; The METER now calculates the new Calibration factor (K Factor) and displays:

After a few seconds the METER **automatically exits the customization mode** and starts using the new Calibration Factor.

Direct modification of the calibration factor

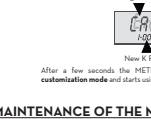
One dispensing operation is enough to carry out the on-site calibration of the liter-counter.
If you wish to **verify** the result of this calibration, **perform a normal dispensing in the same sample calibrated container**, without re-entering the calibration function in Customization menu.
The direct correction of the Calibration Factor is useful when:
- the K Factor in use must be corrected by a known percentage;
- a K Factor already known must be added.

When the METER displays:

press the AUTO key, release it and press the AUTO key again.
The METER displays:

The METER is ready to accept the direct modification of the K Factor.
Press the "+" key to increase the indicated value.
Press the "-" key to decrease the indicated value.

Each time a key is pressed, the last digit on the right is modified by one unit.
By keeping the keys pressed, the value changes, slowly at first and then rapidly.
Press the AUTO key to confirm that the correction of the indicated value is over.
The METER stores the new Calibration Factor (K Factor) and displays:



After a few seconds the METER **automatically exits the customization mode** and starts using the new Calibration Factor.

8 MAINTENANCE OF THE METER

The only **routine maintenance** operations required by the METER are:
- battery replacement;
- filter cleaning.

These activities can be easily performed using standard tools. Any other **extraordinary maintenance** operation must be carried out by an authorized Service Centre.

8.1 BATTERY REPLACEMENT

The METER continuously controls the battery charging state. As soon as the charge decreases below a given level, the METER displays:

warning the Operator about the need to replace the batteries.

As soon as the message "bAtt" is displayed, dispensing in "AUTO" mode is immediately inhibited and it is no longer possible to lock the trigger in open position. This prevents the unit from dispensing continuously in AUTO mode even if the PRESET value has been reached, due to an insufficient battery charge.
Even when the message "bAtt" is displayed, it is still possible to perform dispensing in MANUAL mode.
Although it is possible to carry out **tens of dispensing operations** in MANUAL mode, even after the message "bAtt" is displayed, **the battery must be replaced as soon as possible to resume the full operation of the METER** and to prevent the LCD image quality from deteriorating, thus causing metering errors. When the message "bAtt" blinks, the TOTAL is **constantly updated,** although no longer displayed.

- **To replace the battery:**

1. Using a small screwdriver (PH cross head, bit no. 1) completely slacken the four screws of the battery compartment cover and remove it.
2. remove the flat batteries;
3. install the new batteries;
4. replace the cover and tighten the four screws.

WARNING: press the RESET key after battery replacement.
The METER will restart automatically, carrying out a short SELF-TEST:
- **complete lighting of the LCD;**
- **complete power-off of the LCD;**
- **display of the electronic board serial number;**
- **normal operation mode resumed.**

Battery replacement does not cause any data loss. **The METER customization, previously set, remains operational** at the next re-starting.

8.2 CLEANING THE FILTER

The METER is equipped with a removable filter for inspection and cleaning, installed inside the swivel.

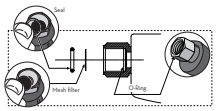
Filter clogging can strongly reduce the maximum flow-rate supplied by the METER.
Regularly clean the filter and check it each time a reduction in flow-rate is detected.
To reduce the frequency of filter cleaning operations, the METER dispensing system should be equipped with suitable line filters.

- **To clean or replace the filter:**

1. Release the line pressure and dismount the METER in compliance with the instructions given in paragraph 5.2.
2. Unscrew the 1/2" nut and remove the filter/ring disk.
3. Properly clean the filter or use a new filter (see Spare parts list in paragraph 10.3).
4. Place the filter again, **paying attention to components' positioning.**
- Do not use filters which have been damaged during improper dismounting or cleaning operations.
- Always reposition the filter with the utmost care.

Only a filter in good condition and correctly installed can guarantee the good operation of the METER, thus preventing any dust or foreign bodies from locking or damaging the METER valve.

5. Reassemble the METER according to the instructions given in paragraph 5.6.
6. Fix the swivel again and tighten at 20 Nm.



9 PRODUCT IDENTIFICATION

Some technical data of the METER, which is essential for its safe use, is indicated on the CE plate located on the right side of the handle.

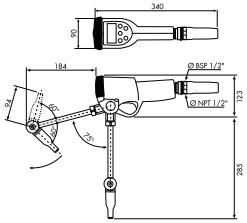
10 CONSTRUCTION DATA

10.1 TECHNICAL DATA

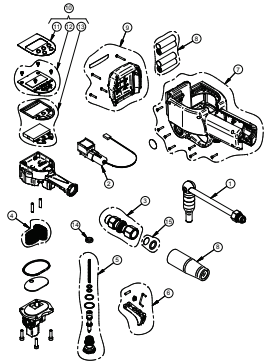
Measuring principle	Oval gears
Flow range:	• **1** to **30*** liter/min • 0.26 to 7.9 gpm
Pressure range	• **50*** to **7000** KPa • 7 to 1015 psi
Temperature range	operating: • **-5** to **+50** °C • +23 to +11 °F storage: • **-35** to **+60** °C • -31 to +140 °F
Viscosity range	• **10** to **5000** mPa s
Accuracy	• **+/- 0.5** % % of indicated value after calibration.
Repeatability	• **+/- 0.2** % of indicated value
Resolution	• **0.001** liters • **0.001** gallons
Pressure loss	• at **10** liter/min with **80W oil** at **21°C** 2.6 gpm with 80W oil at 70 °F with high flow-rate spouts: • **150** KPa • 22 psi with dripless valve: • **450** KPa • 65 psi
Unit of measure	**Liter / Gallon / Pint / Quart** selectable by the operator.
Indications	Batch Total: • floating point: **0.000** to **999.9** units Total/Resettable Total: • **999999** units
Presettable amount:	• **0.1** to **99.9** units
Battery	• nr. 4 standard batteries 1.5 V (size AA) • **Expected life:** up to **10,000 operations per year** in AUTO mode. • AUTO mode inhibition when "low battery" indication is displayed.
Swivel	• 1/2= BSP Female thread • 1/2= NPT Female thread (optional)
Weight	Batteries included • **1.55** Kg • 0.41 Lbs
Fluid compatibility	• lubricating oils (mineral, synthetic) • antifreeze mixtures
Materials in contact with the fluid	• Steel / stainless steel • Aluminium • Brass • Polyurethane • Acetalic resin • Nitrile rubber

*** with high flow-rate spouts**

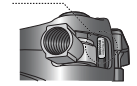
10.2 DIMENSIONS



10.3 SPARE PARTS EXPLODED VIEW



When ordering spare parts, please always specify.
- **Position No. of spare part,**
- **Model,**
- **Serial number.**



10.4 TROUBLESHOOTING

PROBLEM	*POSSIBLE CAUSE*	*CORRECTIVE ACTION*
Reduced flow rate	Dirty filter	Clean the filter after having properly flushed the feeding lines from dirty particles (see par. 5.3 of the user manual).
	Insufficient pump pressure	Use a pump able to create higher pressure.
	High oil viscosity	If possible, keep the oil warmer, in order to reduce viscosity.
Lack of accuracy (within few percentage error)	Necessity to calibrate the meter into the specific operative condition	Calibrate the instrument following the instruction at par. 7.7 of the User manual.
	The feeding line has not been purged from the air	Purge the lines (see par. 5.7 of the user manual).
Evident inaccuracy	Counting system malfunctioning	Contact your dealer for repair
The meter doesn't count	Counting system malfunctioning	Contact your dealer for repair
LCD shadowed	The instrument has been used too long with the flashing message "bAtt" (see chap. 8 of the user Manual)	Replace the battery.
LCD black	The batteries are completely flat.	Replace the battery.
Impossible to enter the AUTO mode	If the display is flashing the message "bAtt", the dispensing in AUTO mode is inaccessible for safety reason (see par. 8.1 of the User manual)	Replace the battery.
In AUTO mode, the trigger doesn't remain in open position	There is a problem on the trigger locking system	Contact your dealer for repair.
The trigger doesn't release	The used fluid is not compatible	Use the instrument with compatible fluids.
	The valve doesn't work	Contact your dealer for repair.
Leaking from the drip-free shutoff valve	Improper seal of the valve nozzle	Once dismantled the extension, check the tightness of the valve nozzle. If negative, contact your dealer for repair.
	The drip-free shutoff valve doesn't close correctly	Once dismantled the extension, check the tightness of the valve nozzle. If positive, replace the drip-free shutoff valve.
Leaking from the trigger	The seals have been damaged	Contact your dealer for repair.
Leaking from the swivel	Improper hose installation	Verify the proper installation of the hose.
	Not compatible threads	Verify that the hose and the inlet swivel threads are the same.
Leaking from the extension	The installation of the extension on the nozzle has not been made correctly	Verify the presence of all components and nut tightening (see par. 5.5 of the user manual).
The extension blew off from the nozzle	The installation has not been made correctly	Verify that the spring washer has been installed and check the nut tightening (see par. 5.5 of the user manual).
High wearing out of the batteries	Possible short circuit due to some water trapped into the battery compartment	Avoid to sprinkle water against the nozzle.
	Possible short circuit due to humidity into the battery compartment	The instrument has been designed to be used indoor. Do not use outdoor.
	Battery installation and contacts not correct	Verify that there is not any short circuit on the battery contacts.
	Electronic board malfunctioning.	Contact your dealer for repair.
Failing to start after battery replacement	Defective contact at the battery installation.	Disconnect the batteries and wait for 30 seconds.
DATA ERROR on the display	Defective board	Replace the board.

11 DISPOSAL

Foreward

In case the system should be demolished, its parts must be given to companies specialised in industrial waste disposal and recycling; in particular:

Disposal of Packaging

Packaging consists of biodegradable cardboard that can be given to firms charged with cellulose recovery.

Disposal of Metal parts

The metal components, both painted and in stainless steel, are usually recycled by companies that are specialised in the metal-scrapping industry.

Disposal of electrical and electronic components

These have to be disposed by companies that are specialised in the disposal of electronic components, in accordance with the instructions of 2012/19/UE (see text of Directive below).

Environmental information for customers in the European Community

European Directive 2012/19/UE requires that the equipment bearing this symbol on the product and/or its packaging must not be disposed of with unsorted municipal waste. The symbol indicates that this product should be disposed of separately from regular household waste streams. It is your responsibility to dispose of this and other electric and electronic equipment via designated collection facilities appointed by the government or local authorities.

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.

Disposal of Other parts

The disposal of other parts such as pipes, rubber seals, plastic components and cables should be entrusted to companies specialized in the disposal of industrial wastes.

PIUSI — Fluid Handling Innovation

K500 PRESET BATCH METER

MADE IN ITALY

EN

Installation use and maintenance

BULLETIN M00920 EN_00

1 INDEX

2 CE DECLARATION OF CONFORMITY

The undersigned:
PIUSI S.p.A
Via Pacinotti 16/A z.i. Rangavino
46029 Suzzara - Mantua - Italy

DECLARES
on its own responsibility, that the machine described below:
Description: Dispensing nozzle for oil.
Model: **K900**
is in compliance with the legislative regulations which transpose directives:
- 2014/30/EEC (electromagnetic compatibility directive) and subsequent amendments.
Documents are made available to the appropriate authority on request at Piusi S.p.A.
Alternatively, it can be requested writing to: e-mail: doc.tec@piusi.com
The person in charge of writing both the technical file and the conformity statement is Otto Varini as the legal representative.

Suzzara 20/04/2016

Otto Varini
The legal representative

3 GENERAL PRECAUTIONS

Important warnings
In order to protect workers' safety, to avoid damaging and before performing any operation, please read and familiarize with the whole instruction manual.

Symbols used in the manual
In order to signal particularly important instructions or warnings, the following symbols are used:

This symbol highlights important aspects as to **SAFETY**.

This symbol highlights important aspects as to the **CORRECT USE** of the METER.

This symbol highlights important aspects as to avoid **POLLUTION HAZARDS**.

The instructions provided by this manual satisfy both the Installer's and the Users's requirements (Manager and Operators) of the METER.
In the Table of Contents a symbol alongside each paragraph indicates the person this information is intended for.

Operator
All paragraphs marked with this symbol concern the Operator.
The operator is the person who uses the METER to carry out dispensing operations.
Therefore the Operator is not expected to read paragraphs other than those marked with this symbol.

Manager
All paragraphs marked with this symbol concern the Manager.
The METER offers several options (selection of the unit of measurement, selection of the Number of Decimal Digits, Calibration, etc.). At least one skilled Operator (hereinafter referred to as the Manager) must know this data in order to allow the Operators to use the METER correctly. The Manager must read thoroughly all paragraphs concerning the Manager and the Operator.

Installer
All paragraphs marked with this symbol concern the Installer only.
He is responsible for installing the METER and is required to read the manual thoroughly, no paragraph omitted.

Manual storage
This manual must be intact and completely readable. The final users, as well as the qualified technicians authorised to installation and maintenance must be able to view it at any time.

Reproduction rights
Piusi S.p.A. is the exclusive owner of all rights envisaged by applicable laws, including the rules concerning copyrights.
All rights arising from these standards are reserved to Piusi S.p.A., even partial reproduction of this manual, its publication, edit, transcription, communication to the public, distribution, marketing in any form, translation and/or processing, lending, and any other activities are reserved by law to Piusi S.p.A..

This manual is and **essential and integral part of the product** and must be handed over to the personnel who carries out the installation, uses and maintains the METER.
Read all indications given in this manual as they provide important instructions as to safe installation, use and maintenance.
Keep this manual safe for future reference.
Do not remove, tear or modify any part of this manual for any whatsoever reason.
In case of loss or damage, a new copy can be requested to the manufacturer, provided the relevant code is indicated.

The manufacturer is not liable for any damage to persons, things or the unit itself, if the latter is installed or used incorrectly.

3.1 SAFETY WARNINGS

ATTENTION
Mains - preliminary checks before installation
Control and maintenance operations

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

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

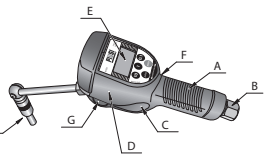
FIRE AND EXPLOSION
To help prevent fire and explosion:
Use equipment only in well ventilated area.
Keep work area free of debris, including rags and spilled or open containers of solvent and gasoline.
Do not plug or unplug power cords or turn lights on or off when flammable fumes are present.
Ground 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.

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 in operation.
Turn off the equipment when not in use.
Do not alter or modify the 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.
Keep children and animals away from the working area.
Respect all safety norms in force.

TOXIC FLUID OR FUMES HAZARD
For issues arising from the treated product with eyes, skin, inhalation and ingestion refer to the safety data sheet of the fluid used.
Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
Prolonged contact with the product may cause skin irritation; during delivery phases, always wear protective gloves.

4 GETTING TO KNOW THE METER

The METER is a dispensing nozzle for oils and other fluids, to be installed as a final shutoff device at the end of pressurized flexible hoses.
Besides guaranteeing an exact measurement and display of the fluid amount dispensed, when used as a normal nozzle.
The METER also allows the user to PRESELECT the quantity to be supplied and automatically stops dispensing when the preset amount has been reached.
The METER integrates:



A. An ergonomic handle.
B. A swivel, with a rubber cover, which allows the user to rotate the handle independently from the connected flexible hose.
C. A flow control valve, activated by a trigger, which is equipped with a protection against accidental starts.
D. A meter with oval gears, controlled by an electronic board and equipped with a battery-powered microprocessor.
E. A large liquid-crystal display, integrated in the 5-key keypad, for the communication between the K900 and the Operator.
F. A motorized valve shutting system, automatically activated by a microprocessor when dispensing a PRESELECTED amount (AUTO mode).
G. A multi-position extension to adjust the angle of the valve with respect to the handle.
H. An automatic no-drip valve, adjustable with respect to the end, to further facilitate dispensing in confined spaces.

4.1 DETAILED INFORMATION ON THE METER

The handle
An external shock-resistant plastic cover contains all the components of the METER and provides an ergonomic handle.

The batteries
The batteries are housed in the upper compartment. The cover is fixed by means of four cross-head screws. The user can easily access this compartment to replace the batteries.

The swivel and filter
The METER is equipped with a swivel to be connected to the flexible hose.
The swivel is equipped with a 1"/2" female thread (BPS or NPT) and houses the filter.
The large filtering surface guarantees a reduced pressure loss.

The rubber cover of the swivel
During installation the swivel may be equipped with a rubber cover to prevent the swivel itself or the metal end of the flexible hose from damaging the vehicle body.
This cover is available in different colours, which can be used as a "colour code" to identify the dispensed product easily.

The trigger
The METER is equipped with a balanced valve, controlled by a trigger, which can be activated using just one finger.
The trigger, protected against accidental starting, can be:

Released
The valve is in **closed position**.

Fully pressed
The valve is in **maximum open position**.

Locked in open position
The valve is in open position for **automatic operation**.

The liquid-crystal display "LCD"
The METER uses an LCD with the following numeric registers and indications:

1. **Batch total** (4 digits, floating point)
2. **Totals** (7 digits).
3. **Indication** of the Total type (TOTAL / Resettable TOTAL).
4. **Indication** of the Unit of Measurement:
QTS = Quarts
PTS = Pints
LIT = Liters
GAL = Gallons
5. **Indication** of operation in AUTO mode.

The LCD automatically turns off if the METER is not used for a certain period.

To reactivate the LCD press the RESET key.

Keypad
The keypad is of membrane type and is equipped with 5 keys.

Numeric keys
to be used **to set the PRESET value** (automatic dispense stop value).

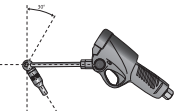
AUTO key
to be used to **select and confirm the PRESET value.**

RESET key
to be used to reset the Batch Total and to display the Resettable TOTAL.

Liter-counter meter
To guarantee an accurate measurement of the dispensed amount the METER uses the principle of the oval gears.

Multi-position extension
To guarantee an easy use, the METER is equipped with a multi-position extension. It can be positioned by the operator within a 75° range.

The dripless valve can be rotated by 240°



4.2 MANUAL AND AUTO OPERATION

The METER is a PRESETTABLE dispensing nozzle which can be used in two operating modes:

MANUAL Mode
In MANUAL mode, dispensing starts as soon as the Operator operates the trigger.
The only preliminary operation to be carried out by means of the METER keys is the possible resetting (RESET) of the value previously indicated on the Batch total.
The operator must check the dispensing operation personally and stop it by releasing the trigger when the desired amount is reached.
The METER has been designed to ensure maximum safety during use an avoid oil spillage due to an improper use or operator's carelessness.
In particular the METER does not allow **the valve to be locked in open position during MANUAL mode**. This avoids a continuous dispensing, should the operator be absent or has not preset an automatic stop value (AUTO mode).

AUTO Mode
To dispense using the PRESELECTION option, before starting dispensing the operator must:
- **Select** the desired amount by means of the METER keys as explained in paragraph 6.2.
- **Confirm** the selected value thus entering the AUTO mode: The METER displays the **AUTO** message and is ready to dispense automatically without requiring the presence of the operator.
- **Start dispensing**, by pulling the trigger and setting it to the locked position.

The operator's presence is no longer needed and he can wait until the METER automatically stops once the selected amount has been dispensed.

In any case the operator must attend to the METER while dispensing in AUTO mode in order to avoid any oil spillage due to external factors.

Carefully read the instructions given in paragraph 6.2 before dispensing in AUTO mode.

The METER allows the user to lock the trigger in open position only when the display shows the message **AUTO**.
To lock the trigger in open position:
- pull it completely;
- then release it.

If the message AUTO blinks, automatic dispensing cannot be started; if the trigger is completely pulled and afterwards released, it does not remain locked in position, but it closes again thus interrupting the dispensing operation.
The blinking message **AUTO** indicates that **the selecting phase of the desired value is still in progress**, but the AUTO mode has not yet been entered by confirming the displayed value.
The METER automatically unlocks the trigger thus stopping the dispensing when the predetermined value has been reached.
However, while dispensing in **AUTO mode,** it is possible to stop dispensing manually before the desired value is reached by unlocking the trigger.
To unlock the trigger and set it in closed position again:
- pull it completely;
- then release it.

When the dispensing has been manually stopped, as soon as the AUTO message is displayed, it is possible to restart the automatic operation as the trigger can still be locked in open position.
The METER automatically exits the AUTO mode after a given period of time (TIME OUT) without dispensing.

5 INSTALLING THE METER

This paragraph describes the necessary operations to be carried out when the METER is installed for the first time on a new system or to replace an existing nozzle with the METER.

5.1 SYSTEM REQUIREMENTS

The METER has been designed to be used as a component of a **centralized system for oil distribution** and other industrial fluids, which must be**manufactured and installed by specialized personnel in compliance with the standards** relevant to such a pressurized system.
To explain the installation and maintenance operations relevant to the METER, refer to the following diagram which shows **a typical installation**, as regards to the components located directly upstream any **"dispensing outlet"** of the METER.

1. Distribution system lines.
2. Shut-off valve.
3. Flexible hose for reel entry.
4. Reel.
5. Flexible hose.
6. Nozzle.

The presence of the **shut-off valve** in the system is necessary to ensure a safe and correct installation and maintenance of the METER without requiring to make the whole system unserviceable.
The structure and complexity of the system upstream the above-mentioned shut-off valve (rigid or flexible feeding lines, pumps, tanks, valves, etc.) as well as the possible presence of the flexible hose reel can be freely chosen by the installer. In fact they do not affect the maintenance operations of the METER.

5.2 LINE PRESSURE RELIEF

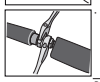
This operation is to be carried out when replacing a pre-existing nozzle with the METER nozzle or when dismounting the METER for maintenance purposes.

Failure to carry out the line pressure relief procedure may cause damage to persons or things.

- **Close the shut-off valve.** Otherwise **stop the feeding pump** and make it unserviceable to avoid an accidental re-start during maintenance operations.
- Operate the valve of the nozzle to be replaced (or of the METER to be disassembled for maintenance purposes) dispensing into a suitable container in order to release the line pressure.

If a **dripless valve** is installed at the end of the nozzle, the pressure inside the line will not drop to zero, but it may remain around 0.2 - 0.5 bar, according to the dripless valve used.

- Only for METER dismounting: remove the rubber cover from its coupling on the swivel and move it along the flexible hose in order to gain an easy access to the swivel.



- By means of two wrenches, unscrew the threaded end of the flexible hose from the swivel.

Be careful to collect any oil leakage into a suitable container.

5.3 FLUSHING THE LINES

Flushing the lines means to let a given amount of oil flow inside them, so as to ensure a proper **"washing"** of the whole system, a correct cleaning **and the absence of dirt, contaminated material or processed waste inside the lines before installing the nozzle.**
The flushing operation must be carried out on **all lines upstream the nozzle** and, in case the system is equipped with more than one nozzle, flush the lines which supply the nozzles farthest away from the supply pump, then continue with the nozzles situated near the pump.
The flushing procedure depends on the type and features of the system and must be carried out by trained and qualified personnel in compliance with the procedures set down by the installer.

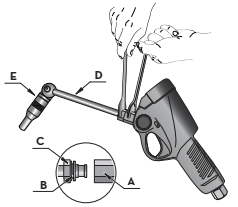
This operation is absolutely necessary with NEW INSTALLATIONS or if the lines used are contaminated.
Consequently it may not be necessary to carry out this procedure when replacing a nozzle already in use.

5.4 PRELIMINARY CHECKS ON THE METER

- Make sure that the threaded end fitted on the flexible hose is suitable for the swivel of the METER equipped with: **Female thread 1/2" BSP** or **Female thread 1/2" NPT.**
- Check that the METER nozzle to be installed is complete and in good condition, making sure that the **filter** is **clean** and **correctly installed** (see paragraph 8.2).

The METER filter, characterized by a large filtering surface, has been designed to guarantee a correct filtering and a low pressure loss.
To remove and re-install the filter, refer to paragraph 8.2.
The absence or improper installation of the filter may **block the METER valve** or **the liter-counter** if dirt is present in the tubes. This situation may occur especially during new installations. To solve these problems, **consult a qualified Service Centre.**

5.5 MOUNTING THE EXTENSION ON THE METER

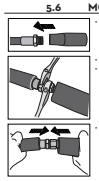


Three different types of extensions can be installed on the METER nozzle:
- SWIVELLING extension;
- RIGID extension;
- FLEXIBLE extension;

All of them are equipped with an **automatic dripless valve.**
All extensions on the nozzle side are equipped with a rigid ending part (external Ø 12 mm, 3/8"G nut) suitable for a quick connection to the METER without using any sealant.
- Remove the plug from outlet **A** (3/8"G).
- Make sure that gasket **B** on the swivel is correctly seated.
- Lubricate the gasket and its seat.
- Tighten end **D** on METER by means of two wrenches; while the first one on outlet **A** locks the METER, the second one tightens nut **C** on end **D**. Before locking nut **C** orientate valve **E**.

An improper tightening of the extension may cause it to become loose thus endangering persons or things. Tighten the ring nut with a torque wrench setting of 5.5 Kgm

5.6 MOUNTING THE METER



- Fit the rubber cover of the swivel into the flexible hose, in the direction indicated in figure, making it slide over the male thread of the hose.
- Apply a thread sealant to the male thread of the hose.
- Tighten the swivel completely by means of two wrenches.
- Slide the rubber cover towards the valve until it fits into the seat, located on the swivel.

5.7 AIR PURGING FROM THE LINES

After the installation of the nozzle, a certain quantity of air will be inevitably present both inside the flexible hose downline the shut-off valve and in the other system lines. To purge the air and guarantee a **steady flow and a correct calculation of the amount dispensed,** two operators should proceed as follows:
- With the shut-off valve still closed, insert the METER extension into the opening of a container of suitable capacity, to avoid spraying or spillage which may occur during the initial irregular flow.
- While the first operator acts on the METER trigger, the second must open the shut-off valve; when the flow starts being steady, the second operator shall set the valve to the fully open position.
- Continue line purging while keeping the METER valve completely open, till reaching a steady flow. At this point release the trigger thus stopping dispensing.

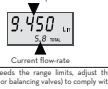
5.8 CHECKING THE FLOW-RATE

Once carried out the installation and purging operations, it is advisable to check the dispensing flow-rate which must comply with the range indicated in paragraph 10.1, to ensure a correct operation of the valve.

The METER allows the user to check easily and directly the dispensing flow-rate:

During the operation in MANUAL mode, **press and keep pressed the AUTO key.**

The METER will display the current flow-rate in units per minute.



If the flow-rate exceeds the range limits, adjust the system components (pumps or balancing valves) to comply with them.

6 USING THE METER

- The METER has been designed for professional use and must be **utilized by adult personnel properly trained for the intended purpose.**
- The METER must not be used outside the operating ranges (see Technical Data in paragraph 10.1) or for fluids other than lubricants and anti-freeze mixtures.
- Do not tamper with or modify the METER.
- Regularly check the good condition of the METER.
- The METER dispenses high-pressure fluids; do not point the nozzle to any part of the body.
- Use the protection equipment recommended by the national standards relevant to the dispensed products.
- Do not carry out any maintenance operation on the METER without previously relieving the pressure from the system lines.
- The METER is designed for indoor use only.

Is used outdoors, make sure it will not be exposed to rain, snow or direct sunrays.

In case of manual dripless valve, after a daily use it is important to discharge the overpressure between the chamber **(1)** and the manual valve **(2)** of the spout. Carry out this operation with the pump switched off. Then unscrew the valve **(3)**. During this discharging operation, do NOT push the trigger **(3)**.

6.1 DISPENSING IN MANUAL MODE

The METER can be used as a normal dispensing nozzle if the operator does not preset an automatic stop value.

If the METER is off, press RESET to restart it.

The METER displays:

The METER can be programmed to display the last amount dispensed until the RESET button is pressed or to automatically reset the Batch Total a few minutes after a dispensing operation in MANUAL mode (see "Auto RESET" at paragraph 7.5).
If the last dispensing operation has been carried out in AUTO mode, the dispensed amount is never reset, independently from the selection of the Auto RESET.

Resetting the Batch Total
To reset the batch total, press RESET. The METER will display:

Resetting the Total
To reset the resettable Total, press and keep pressed the RESET key. The METER will display:

Dispensing
Pull the trigger to dispense.

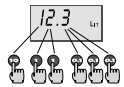
Release the trigger to stop dispensing.

6.2 DISPENSING IN AUTO MODE

The METER allows the user to select the automatic stop value - **"PRESET value"** - with different procedures:
The METER allows the user to directly set the PRESET value by means of the numeric keys.
If the METER is off, press RESET to restart it.
The METER will display:

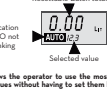
Direct setting of a new PRESET value

To select a new PRESET value (for example 12.3) use the numeric keys.



The METER will display:

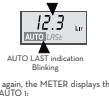
As long as the AUTO message blinks, it is not yet possible to start a new automatic dispensing; if the trigger is completely pulled, when released, it does not remain locked in open position but closes again thus interrupting the dispensing.
The blinking message **AUTO** indicates that **the selecting phase of the desired value is still in progress**, but the AUTO mode has not yet been selected by confirming the displayed value.
To confirm the PRESET value, **press and keep pressed the AUTO key** until the METER displays:



Selecting a PRESET value
The METER allows the operator to use the most frequently used PRESET values without having to set them by means of the numeric keys.
In particular, the METER stores:
- The last PRESET value **"AUTO LAST"**,
- Five different PRESET frequent values **"AUTO 1 ... AUTO 5"**.

The **AUTO LAST** value is automatically updated each time a new PRESET value is set by means of the keypad; the last value used replaces the previous one in memory.
The **"AUTO 1 ... AUTO 5"** values can be freely set and modified according to the procedure indicated in paragraph 7.2.
If the METER is off, press RESET to restart it. The METER will display:

Press AUTO. The METER displays the PRESET value stored in AUTO LAST.



Pressing AUTO again, the METER displays the PRESET value stored in AUTO 1:

To display the other stored values, press AUTO as many times as necessary to reach the desired value.
The blinking message will be:

As long as the AUTO message blinks, it is not yet possible to start a new automatic dispensing; if the trigger is completely pulled, when released, it does not remain locked in open position but closes again thus interrupting the dispensing.
The blinking message **AUTO** indicates that **the selecting phase of the desired value is still in progress**, but the AUTO mode has not yet been selected by confirming the displayed value.
In this phase it is possible to modify the displayed AUTO value by means of the numeric keys. The modification of the displayed AUTO value, however, does not change the stored AUTO value; to modify the latter, it is necessary to follow the procedure indicated in paragraph 7.2.
To confirm the PRESET value, **press and keep pressed the AUTO key** until the METER displays:

Dispensing in AUTO mode

- **To start dispensing:**

Pull the trigger **fully down** and then release it.

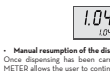
The trigger thus remains locked in open position. Now dispensing can continue even if the Operator is not attending.

- **To stop manually the dispensing in progress:**

Pull again the trigger fully down and then release it.

- The dispensing operation can be resumed in AUTO mode within a given time (TIME OUT) from the stop. Within this TIME OUT the METER still allows the locking of the trigger in open position.
- Once expired this TIME OUT, the METER still allows the user to continue the dispensing but only in MANUAL mode.
- **Dispensing automatic stop:**

The supply automatically stops when the preset value is reached.
The AUTO message disappears from the LCD.



- **Manual resumption of the dispensing (TOPPING UP):**

Once dispensing has been carried out in AUTO mode, the METER allows the user to continue the dispensing operation, if necessary.

To carry out the TOPPING UP, **DO NOT press RESET** and pull the trigger.

The dispensed amount is added to the previous one in AUTO mode. The **PRESET value** previously set, displayed in the Total, **starts blinking to indicate that the preset value has been exceeded.**

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BULLETIN M00972D EN_00