PARTIAL RESET (NORMAL MODE) RESETTING THE RESET TOTAL CALIBRATION **DEFINITIONS** CALIBRATION MODE DISPLAY OF CURRENT CALIBRATION FACTOR AND RESTORING FACTORY FACTOR. IN FIELD CALIBRATION

IN-FIELD CALIBRATION PROCEDURE DIRECT MODIFICATION OF K FACTOR METER CONFIGURATION MAINTENANCE CHANGE BATTERY CLEANING MAI FUNCTIONS **DEMOLITION AND DISPOSAL**

DECLARATION OF CONFORMITY

EXPLODED VIEWS / MAGNET POSITION

PIUSI S.p.A The undersigned: Via Pacinotti c.m.- z.i.Rangavin 46029 Suzzara - Mantova - Italia

TECHNICAL DATA

Hereby states under its own responsibility, that the equipment described below: Description : Meter 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 is in conformity with the legal provisions indicated in the directives : Electromagnetic Compatibility Directive 2014/30/EU

The documentation 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 person authorised to compile the technical file and draw up the declaration is Otto Varini

Suzzara, 20/04/2016

GENERAL WARNINGS

potential damage, workers must be fully acquainted with this instrucon manual before attempting to operate the dispensing system. he following symbols will be used throughout the manual to highlight nation and precautions of particular importance: ATTENTION This symbol indicates safe working practices for operators nd/or potentially exposed persons

To ensure operator safety and to protect the dispensing system from

(//llo Vallen

legal representative

Otto Varini

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

This symbol indicates useful information.

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3 SAFETY INSTRUCTIONS

3.1 SAFETY WARNINGS ATTENTION

You must avoid any contact between the electrical power supply and the fluid that needs to be FILTERED. nect the power source. FIRE AND To help prevent fire and explosion:

ity reserved by the law to Piusi S.p.A.

EXPLOSION Use equipment only in will ventilated area. mable fluids are Keep work area free of debris, including rags and spilled or open present in the ontainers of solvent and gasoline. Do not plug or unplug power cords or turn lights on or off when

as gasoline and windshield wiper flammable fumes are present. fluid, be aware Ground all equipment in the work area. top operation immediately if static sparking occurs or if you feel a shock. Do not use equipment until you identify and correct fumes can ignite Keep a working fire extinguisher in the work area. Do not operate the unit when fatigued or under the influence

EQUIPMENT of drugs or alcohol. Oo not leave the work area while equipment is energized or under pressure. cause death or Turn off all equipment when equipment is not in use. serious injury Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards.

Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. Keep children and animals away from work area omply with all applicable safety regulations. Read MSDS's to know the specific hazards of the fluids you are using. Store hazardous fluid in approved containers, and dispose of it

according to applicable guidelines. rolonged contact with the treated product may cause skin irritation: always wear protective gloves during dispensing.

3.2 FIRST AID RULES

have suffered electric shock

PROHIBITED

TOXIC FLUID

MISUSE

Disconnect the power source, or use a dry insulator to protect yourself while you move the injured person away from any electrical conductor. Avoid touching the injured person with your bare hands until he is far away from any conductor. Immediately call for help from qualified and trained personnel. Do not operate switches with wet hands. hen operating the system and in particular during refuelling, not smoke and do not use open flame.

ENGLISH (Translated from Italian)

3.3 GENERAL SAFETY RULES Essential protec-

Wear protective equipment that is: suited to the operations that need to be performed esistant to cleaning products.

ear the following personal protective equipment during haning and installation lose-fitting clothing;

otective gloves Safety goggles;

nstruction manua

3.4 PACKAGING FOREWORD

tive equipment

that must be

K400 COMES PACKED IN A CARDBOARD BOX WITH A I - contents of the package

2 - weight of the contents 3 - description of the

FUNCTIONING

OPERATIONAL

K400 components

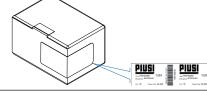
RESET button

▲ - CAL button

5- Battery housing

3- Measurement chamber

PRINCIPLE



3.5 PACKAGE CONTENTS/PRE-INSPECTION

To open the packaging, use a pair of scissors or a cutter, being careful not to damage the dispensing system or its components. In the event that one or more of the components described below are missing from inside the package, please contact Piusi inc technical support.

oils, diesel, rapsoil and antifreeze.

Check that the data on the plate correspond to the desired specifications. In the event of any anomaly, contact the sup-plier immediately, indicating the nature of the defects. Do not use equipment which you suspect might not be safe.

surement system, designed for easy and precise measuring of

data, even in the event of a complete power break for long periods.

KNOWLEDGE K400 METER is an electronic digital meter featuring an oval-gear mea-

> 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, beween the magnets installed in the gears and a magnetic switch outside the measurement chamber, ensures measurement cham ber sealing and ensures transmission of the pulses generated by gear rotation to the electronic board microprocessor. In the dispensing mode (Normal Mode), the partial and the total amounts are shown in two different registers of the LCD.



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.

12,345 Q₁₈

ed from the fluid-bath measurement chamber and sealed from the outside by means of a cover ne meter is in standby, meaning when the display screen shows 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. Partial register (5 figures with moving 6 Indication of type of total, (TOTAL / Re-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 23412.3 TOTAL **G**A and, after a few moments, the reset total is replaced by the non

6.1.2 RESETTING THE RESET TOTAL

The reset total resetting operation can only be performed af

ter resetting the partial register. The reset total can in fact be reset by pressing the reset key at length while the display

creen shows reset total as on the following display page:

Wait for the display to show normal standby display page (wit

While the display page showing the reset total is displayed

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.

Schematically, the steps to be taken are:

The meter starts to reset the partial

ress the reset key again for at least 1 second

CALIBRATION

total only displayed)

FOREWORD

Press the reset key auickly

ne measurement electronics and the LCD display are fitted in the top part of the meter, isolat-

Totals register (6 figures with moving 9 Indication of unit of measurement of Par-

set TOTAL);

tial: Qts=Quarts

L=Litres

Indication of unit of measurement of To-

Gal=Gallons

omma FROM 0.1 to 99999) indicating

comma FROM 0.1 to 999999), that can

4.1. General Total that cannot be reset (TOTAL)

Indication of total multiplication factor

4.2. Resettable total (Reset TOTAL)

the volume dispensed since the reset

button was last pressed

Indication of calibration mode

indicate two types of Total:

2 Indication of battery charge

(x10 / x100)

The measurement chamber is located in the lower part of the strument. It features a threaded inlet and outlet. The cover on the bottom part provides access to the measure ment mechanism for any cleaning operations. 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 <u>calibration factor</u> (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 alled FACTORY K FACTOR equal to 1,000. For best meter performance - adapting this to the intrinsic charac-teristics of the fluid to be measured - the instrument can be "calirated". It is possible to return to factory calibration at any time.

he METER is powered by two standard type 1.5 V batteries (size 1N). The battery housing is closed by a threaded watertight cap hat can be easily removed for quick battery change.

4.2 USERS BUTTONS

The METER features two buttons (RESET and CAL) which individually perform two main functions and, together, other secondary functions. for the RESET key, resetting the partial register and Reset Total **FUNCTIONS** for the CAL key, entering instrument calibration mode

Used together, the two keys permit entering configuration mode where **FUNCTIONS** CALIBRATE MEANS PERFORMING ACTIONS ON THE METER KEYS. BELOW IS THE LEGEND OF THE SYMBOLS USED TO DESCRIBE THE ACTIONS TO BE PERFORMED



ENGLISH (Translated from Italian) ENGLISH (Translated from Italian)

7.1 DEFINITIONS

Multiplication factor applied by the system to the electrical pulses re-

Factory-set default factor. It is equal to 1,000. This calibration factor en-

Even after any changes have been made by the user, the factory k factor

Display the currently used calibration factor:

Two procedures are available for changing the Calibration Factor:

concerning calibration and total dispensed quantity stored for an indefinite time, even in the case of a long power break; after

Return to factory calibration (Factory K Factor) after a previ-

Change the calibration factor using one of the two previously

In-Field Calibration, performed by means of a dispensing operation

Direct Calibration, performed by directly changing the calibration factor

The K400 features a non-volatile memory that keeps the data

changing the batteries, calibration need not be repeated.

Cal FRCT

0.998

12.345

cal USER

ceived, to transform these into measured fluid units.

can be restored by means of a simple procedure.

ous calibration by the user

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 K400

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

USER K FACTOR: Customized calibration factor, meaning modified by calibration.

indicated procedures

7.2.1 DISPLAY OF CURRENT CALIBRATION FACTOR

By pressing the CAL key while the appliance is

n Standby, the display page appears showing

bration has ever been performed, or the factory

setting has been restored after previous calibra-

he word "Fact" abbreviation for "factory" shows

the current calibration factor used. If no call

tions, the following display page will appear:

that the factory calibration factor is being used

lf, on the other hand, calibrations have beer

made by the user, the display page will appear

showing the currently used calibration factor

1.000

deleted from the memory

The word "user" indicates a calibration factor | Cal USER

12.345

23412.3 E.SIPES

BBBBB^{Qrs}

Cal \$88888.8 555 64

12.345

23412.3 E.SIPES

When the Factory Factor is confirmed, the old User factor is

This procedure calls for the fluid to be dispensed into a graduated

sample container in real operating conditions (flow rate, viscosity,

When the Factory Factor is confirmed, the old User factor is deleted

For correct K400 calibration, it is most important to:

TIME OUT

(in our example 0,998).

The flow chart alongside shows

the switchover logic from one

In this condition, the Reset key

permits switching from User

To confirm the choice of cali-

bration factor, quickly press

CAL while "User" or "Fact" are

After the restart cycle, the

K400 uses the calibration

7.2.2 IN FIELD CALIBRATION

factor that has just been con-

ATTENTION

FOREWORD

isplay page to another

factor to Factory factor.

set by the user is being used..

AND RESTORING FACTORY FACTOR.

Temperature: 20°C

7.2 CALIBRATION MODE

Flow rate: 1 - 30 ltr/min

sures utmost precision in the following operating conditions:

Fluid motor oil type 10W40

CALIBRATION

FACTOR OR

FACTORY K

INSTALLATION

FOREWORD The METER features a · inch inlet and outlet, threaded and perpendicular, and has been designed to be installed in any position, both as fixed in-line installation and as moving installation on a dispensing nozzle. Make sure the threaded connections do not interfere with the

inside of the measurement chamber causing the gears to seize. METER does not have a fixed direction of flow and both inlets can be used as inlet and outlet Make sure a filter with adequate filtering capacity is always fit-

> the meter is fitted. If solid particles enter the measurement chamber, the gears could seize. or installations on system, position K400 so that the battery housing can be easily reached. The rubber protection is an integral part of the product. Be

ted either at meter inlet or at the entrance of the line on which

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 K400. 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 to-

sure of its presence and its good conditions

						set and cannot be o	
12.34	5 Q⊤s	 ←	PARTIAL I	register	-	12.345	Qτs
12.3	Reset GAL	•	RESET TOTAL registertotal) RESET TOTAL register	GENERAL TOTAL register (Total)	-	12.3 TOTAL	Gal
	*					top part of the dis e RESET key was las	
	*	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 Par-					

tial 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 <u>never</u> 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 6 digits are available for Totals, plus two icons \times 10/ \times 100. 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

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

12,345 a CA.

6.1.1 PARTIAL RESET (NORMAL MODE) The partial register can be reset by pressing the reset key when 12.345

ATTENTION 23412.3 (TOTAL) **G**A Gris Pris L Gall

0.000

viscosity antifreeze or high-viscosity oils for gearboxes)

In extreme flow rate conditions (close to minimum or maximum

acceptable values)on-the-spot calibration may be required to suit the <u>real conditions in which the meter is required to operate.</u>

When operating close to extreme use or flow rate condi-

tions (close to minimum or maximum acceptable values),

an on-the-spot calibration may be required to suit the real conditions in which the K400 is required to operate.

23412.3 TOTAL GAL

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;

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.

7.2.2.1

-		1	Meter in Standby	12.345	L
THE RESET TOTAL			,	1345 ***	AL .
ration can only be performed af- ter. The reset total can in fact be	5 5 5 5			1395	
key at length while the display on the following display page:	QTS	CAL AL AL	LONG CAL key keying The Meter enters calibration mode, shows «CAL» and displays the calibration factor in use instead of partial. The words "Fact"		L
on the following display page.	23412.3 TOTAL GAL	maril	and "USER" indicate which of the two factors (factory or user) is currently in use.		L
aken are: v normal standby display page (with	ום סטב Q _{TS}	2	Important: This factor is that which the instrument also uses for field calibration measurement operations		
vilorinal standby display page (with	(6,373	RESET SET SET	LONG RESET key keying The Meter shows "CAL" and the partial at zero. The Meter is ready to perform in-field calibration.	0.000	L
ne partial wing the reset total is displayed	(29412.3 MAL)	3 militar	ready to perform innered calibration.	Cal FIELD	
. , =		4	DISPENSING INTO SAMPLE CONTAINER		
least 1 second	QTS Reset GAL	4	Without pressing any key, start dispensing into the sample container	9.800 Cal F(ELD	L
shows all the segments of the dis- switched-off segments and finally here the reset Reset Total is shown.	Qrs		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.		
TION METER is supplied with a factory calib	pration that oncurs pracise		9.800 L Lat 0.0000 L Indicated value Real value		
measuring in most operating conditio erating close to extreme conditions, s • with fluids close to acceptable ran	ns. Nevertheless, when op- uch as for instance: ge extremes (such as low-	RESET	SHORT RESET key keying The Meter is informed that the calibration dispensing operation is finished. Make sure dispensing is correctly finished before performing	9.800	L

partial totaliser (example 9.800) 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 value change

displayed when the following operations 6 or 7 are performed.

ENGLISH (Translated from Italian)

RESET	SHORT RESET key keying The arrow changes direction. The operation can be repeated to alternate the direction of the arrow.		800 FIELD	L
7	SHORT/LONG CAL key keying			
CAL AL AL	The indicated value changes in the direction indicated by the arrow - one unit for every short CAL key keying - continually if the CAL key is kept pressed. The speed increase rises by keeping the key pressed. If the desired value is exceeded, repeat the operations from point (6).		860 FIELD	L
RESET SET SET	LONG RESET key keying The Meter is informed that the calibration procedure is finished. Before performing this operation, make sure the INDICATED value is the same as the REAL value. 9.86	- ·	 END	L
8	9.860 L Indicated value Real value The Meter calculates the new USER K FACTOR; this calculation could require a few seconds, depending on the correction to be made ATTENTION: If this operation is performed after action (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.],[Cal	315 Eno	L
	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 The Meter stores the new work calibration factor and is ready to begin dispensing, using the USER K FACTOR that	0.	000	L
	has just been calculated	Cal	13456 TOTA	r L

7.2.3 DIRECT MODIFICATION OF K FACTOR

If normal Meter 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

New cal. Factor = Old Cal Factor *

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 actor must be higher than the old one as shown in the example. The opposite applies if the

ACTION	
1	METER in Standby.
CAL AL AL	Meter 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 used.
RESET SET SET	The Meter shows "CAL" and the zero partial total. Meter is ready to perform in-field calibration by dispensing – see previous paragraph.
RESET SET LET	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 RESET	SHORT RESET KEY KEYING Changes the direction of the arrow. The operation can be repeated to alternate the direction of the arrow.
CAL ALA	SHORT/LONG CAL KEY KEYING The indicated value changes in the direction indicated by the arrow

from the memory

Not reduce the flow rate to reach the graduated area of the containe

6 Carefully follow the procedure indicated below.

IN-FIELD CALIBRATION PROCEDURE

	NONE			1 tals i
1	Meter in Standby	12.345	L	Com
		1345 TO	TAL .	Com
		(3.13	_	1
CAL AL AL	LONG CAL key keying The Meter enters calibration mode, shows «CAL» and displays the calibration factor in use instead of partial. The words "Fact" and "USER" indicate which of the two factors (factory or user) is currently in use. Important: This factor is that which the instrument also uses for	1.000 cai FRCT (USER)	L L	2 3 4 To ch
	field calibration measurement operations			1
mining	LONG RESET key keying The Meter shows "CAL" and the partial at zero. The Meter is ready to perform in-field calibration.	O.OOO Cal FIELD	L	2
4	DISPENSING INTO SAMPLE CONTAINER			1
	Without pressing any key, start dispensing into the sample container	9,800 Cal FIELD	L	3
	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. 9.800 L L L Indicated value Real value			
RESET	SHORT RESET key keying The Meter is informed that the calibration dispensing operation is finished. Make sure dispensing is correctly finished before performing this operation. To calibrate the Meter, the value indicated by the	Cal ▲ FIELD	L	
5 -	nartial totaliser (example 0800) must be forced to the real value			

6 RESET	SHORT RESET key keying The arrow changes direction. The operation can be repeated to alternate the direction of the arrow.	9,800 L cal▼ FIELD
7	SHORT/LONG CAL key keying	
CAL AL AL	The indicated value changes in the direction indicated by the arrow one unit for every short CAL key keying continually if the CAL key is kept pressed. The speed increase rises by keeping the key pressed. If the desired value is exceeded, repeat the operations from point (6).	9,860 L cal A FIELD
RESET SET SET	LONG RESET key keying The Meter is informed that the calibration procedure is finished. Before performing this operation, make sure the INDICATED value is the same as the REAL value. 9.86	Cal END
	9.860 L Cal* FRCT Indicated value Real value The Meter calculates the new USER K FACTOR; this calculation could require a few seconds, depending on the correction to be made ATTENTION: If this operation is performed after action (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	1.015 -
	finally achieve standby condition. IMPORTANT: From now on, the indicated factor will become the	Cal END
	calibration factor used by the Meter and will continue to remain such even after a battery change	
10	NO OPERATION The Meter stores the new work calibration factor and is ready to begin dispensing, using the USER K FACTOR that has just been calculated	0.000 L cal 13456 TOTAL L
	1	

<u>EXAMPLE</u> Error percentage found: E% - 0.9 %

ACTION	DISPLAY		
1	NONE METER in Standby.	12,345 L	
CAL AL AL	LONG CAL KEY KEYING Meter 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 used.	1.000 Cal FACT (USER)	
RESET SET SET	LONG RESET KEY KEYING The Meter shows "CAL" and the zero partial total. Meter is ready to perform in-field calibration by dispensing – see previous paragraph.	1.000 L Cal FIELD	
RESET SET SET	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.	1.000 L cal A DIRECT	
RESET	SHORT RESET KEY KEYING Changes the direction of the arrow. The operation can be repeated to alternate the direction of the arrow.	1.000 cal • DIRECT	
CAL CAL AL AL MINISTER	SHORT/LONG CAL KEY KEYING The indicated value changes in the direction indicated by the arrow - one unit for every short CAL key keying - continually if the CAL key is kept pressed. The speed increase rises by keeping the key pressed. If the desired value is exceeded, repeat the operations from point (5).	1,003 L cal≜ DIRECT	
RESET SET SET	LONG RESET KEY KEYING The Meter is informed that the calibration procedure is finished. Before performing this operation, make sure the INDICATED value is that required.	L Cal END	
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 findly achieve standby sendition.	1.003 -	

METER CONFIGURATION

uch even after a battery change

NO OPERATION

The METER feature a menu with which the user can select the main measurement unit, Quarts (Qts), Pints (Pts), Litres (Lit), Gallons (Gal);

finally achieve standby condition.

IMPORTANT: From now on, the indicated factor will become the

The Meter stores the new work calibration factor and is ready t

begin dispensing, using the USER K FACTOR that has just b

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

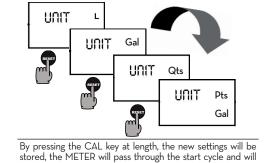
4

Wait for the METER to go to Standby 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) Every short press of the RESET key, the various combinations of the units of measurements are scrolled as shown below:

Cal END

0.000

13456 TOTA





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

then be ready to dispense in the set units.

ENGLISH (Translated from Italian)

9 MAINTENANCE

9.1 CHANGE BATTERY **FOREWORD**

K400 features two low-battery alarm levels:

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 dow • 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 Use 2x1.5 V alkaline batteries size AAA

BATTERY REPLACEMENT

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

When the battery charge falls below the first level on the LCD, 12.345 Qrs the fixed battery symbol appears. In this condition, K400 continues to operate correctly, but the fixed icon warns the user that GAL it is ADVISABLE to change the batteries. 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 LĆD. To change the batter-Press RESET to update all the totals ies, with reference

Loosen the 4 fixing screws of the lower cover to the exploded Remove the old batteries Place the new batteries in the same position of the old ones, proceed as follows being sure that the positive pole is positioned as shown on the rubber protection (pos. 7) Close the cover again, by positioning the rubber protec tion as a gasket K400 will switch on automatically and normal operatio can be resumed

cated before the batteries were changed. After changing the batteries, the meter does not need calibrating again. Do not discard the old batteries in the environment. Refer ATTENTION to local disposal regulations.

The **METER** will display the same Reset Total, the same Total and the same Partial indi

9.2 CLEANING

The METER measurement chamber can be cleaned without ATTENTION

ATTENTION

removing the instrument from the line or from the dispensing nozzle on which it is fitted. Always make sure the liquid has been drained from the meter before cleaning. o clean the chamber, proceed as follows (with reference to

CLEANING the spare parts list positions) Loosen the four cover retention screws (pos. 15) Remove the cover (pos. 14) and the seal (pos. 13) Remove the oval gears.

> Be careful not to damage the body or the gears o reassemble the instrument, perform the operations in the opposite sequence Close the fixing screws on the cover with the tightening couple 8-9-m Only one of the two gears features magnets. This must be fitted in the position marked "MAGNET" (see drawing).

pointed object such as a small screwdriver.

Clean where necessary. For this operation, use a brush or

Once the gear has been fitted, the magnets must be visible

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

s Contact vour dealer

before closing the cover. The gears with magnets are to be placed with the magnets on the bottom (see drawing) Fit the second gear (without magnets) with axis greater an 90° compared to the first gear, and with the holes vis

ible from the cover side

Use, maintenance and calibration EN BULLETIN MO253D ITEN OC

MADE Uso manutenzione e calibrazione

Oval gears

200 (Bar)

95 (% RU)

0,3 (%)

- 5-figure partial

18 · 36 months

-20 · + 70 (°C

-10 · + 50 (°C)

0.005 lit/pulse

70 (Bar) 145 (psi)

1 · 30 (Litres/minute

min) 2,65·23,8 (gallons/min) range

6-figure Reset Total plus x10 / x100

6-figure non reset Total plus x10 / x100

2x1.5 V alkaline batteries size AAA

Liquid crystals LCD. Featuring:

0.5 Kg (included batteries)

Max current: 100 mA Max Voltage: 28V

METER

12 TECHNICAL DATA

ow resistance (at 151/min with oil SAE10W at 20°C | 0.35 bar

easurement systen

Flow Rate (Range)

esolution (nominal)

Operating pressure (Max)

Bursting pressure (Min)

orage humidity (Max)

torage temperature (Range)

Operating temperature (Range

Permissible Viscosity (Range)

uracy (from 5 to 25 l/min

producibility (Typical)

wer Supply

ULB (pulser)

Battery life

MALFUNCTIONS

NOT ENOUGH MEA- SUREMENT PRECISION The meter works below ininimum acceptable flow rate. able flow rate angle has been achieved. REDUCED OR ZERO Gears blocked Clean the measurement chambee Clean the Clean			
NOT ENOUGH MEA- SUREMENT PRECISION The meter works below minimum acceptable flow rate. REDUCED OR ZERO FLOW RATE THE METER DOES NOT With reference to paragraph check the K FACTOR Increase the flow rate until an acceptable flow rate. Increase the flow rate until an acceptable flow rate able flow rate range has been achieve. Clean the measurement chamber and the reasonable procedure.	PROBLEM	POSSIBLE CAUSE	REMEDIAL ACTION
NOT ENOUGH MEA- SUREMENT PRECISION The meter works below minimum acceptable flow rate. able flow rate until an acceptable flow rate. able flow rate range has been achieved. REDUCED OR ZERO FLOW RATE THE METER DOES NOT Incorrect installation of Deposit the reassembly precedure.	LCD: NO INDICATION	Bad battery contact	Check battery contacts
minimum acceptable flow rate. able flow rate range has been achieve REDUCED OR ZERO Gears blocked Clean the measurement chambe THE METER DOES NOT Incorrect installation of Deposit the reassembly procedure.	NOT ENOUGH MEA-	Wrong K FACTOR	With reference to paragraph F check the K FACTOR
FLOW RATE THE METER DOES NOT Incorrect installation of Deposit the reassembly precedure.	SUREMENT PRECISION		Increase the flow rate until an accept able flow rate range has been achieve
		Gears blocked	Clean the measurement chamber
			Repeat the reassembly procedure

DEMOLITION AND DISPOSAL 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 pack- The packaging consists of biodegradable cardboard which can be delivered to companies for normal recycling of cellulose. Metal Parts Metal parts, whether paint-finished or in stainless steel, can be consigned to scrap metal collectors. These must be disposed of by companies that specialize in the disposal

tric and electronic of electronic components, in accordance with the indications of directive 2012/19/EU (see text of directive below). European Directive 2012/19/EU requires that all equipment marked with Informa- this symbol on the product and/or packaging not be disposed of together with non-differentiated urban waste. The symbol indicates that this

RATE IS CORRECT

regarding product must not be disposed of together with normal household waste.

It is the responsibility of the It is the responsibility of the owner to dispose of these products as wel environment for as other electric or electronic equipment by means of the specific refuse collection structures indicated by the government or the local governing 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 conse quences 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.

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





Butts of Bawtry

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