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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: FLOW RATE METER, REMOTE DISPLAY
Model: REMOTE DISPLAY WITH PULSE OUT

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 as 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

To ensure operator safety and to protect the dispensing system from potential damage, workers must be fully acquainted with this instruction manual before attempting to operate the dispensing system.

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

WARNING
This symbol indicates safe working practices for operators and/or potentially exposed persons.
NOTE
This symbol indicates useful information.

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

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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.

Before any checks or maintenance work are carried out, disconnect the power source.
Connect the metal parts of the device to earth.
Stop operation immediately if static sparking occurs or if you feel a shock. Do not use equipment until you identify and correct the problem. Keep a working fire extinguisher in the work area.

Do not operate the unit when fatigued or under the influence of drugs or alcohol.
Do not leave the work area while equipment is energized or under pressure.
Turn off all equipment when equipment is not in use.
Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards.
Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
Keep children and animals away from work area.
Comply with all applicable safety regulations.

Read MSDS 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

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

3.3 GENERAL SAFETY RULES

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

- ☐ Safety shoes;
 - ☐ Close-fitting clothing;
 - ☐ Protective gloves;
 - ☐ Safety goggles;
- Other devices

3.4 PACKAGING

Remote display and meter are packed in a cardboard box with a label indicating the following data:

- contents of the package
- weight of the contents
- description of the product

3.5 PACKAGE CONTENTS

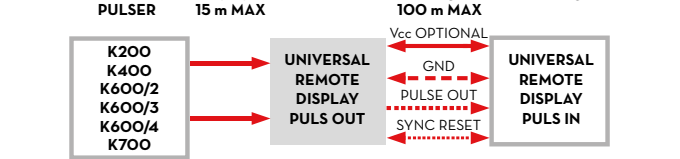
To open the packaging, use a pair of scissors or a cutter, being careful not to damage the dispensing system or its components.

NOTE
In the event that one or more of the components described below are missing from inside the package, please contact Piusi inc. technical support.

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

4 KNOWLEDGE REMOTE DISPLAY

The Universal Remote Display is a remote display system which allows you to view the quantity of fluid dispensed by a K200, K400, K600/2, K600/3, K600/4 and K700 flow meter fitted with an oval-gear measuring system. The Puls Out outlet is available as an optional to transmit impulses to a display repeater known as "Universal Remote Display with Puls IN". Below is the logic connection diagram:



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. The electric impulses are transmitted from the Pulsar to the Universal Remote Display Puls Out by a means of a two-wire cable, and from the Universal Remote Display Puls Out to the Universal Remote Display Puls In by means of a four-wire cable (see block diagram above as well as the ELECTRICAL WIRING DIAGRAM further on in the manual).
- Normal Mode: Mode with display of Partial and Total dispensed quantities
- Flow Rate Mode: Mode with display of Flow Rate, as well as Partial dispensed quantity
The RD features a non-volatile memory for storing the dispensing data, even in the event of a complete power break for long periods.

Main components:
REMOTE DISPLAY

- Display LCD
- Taste RESET
- Taste CAL

WARNING
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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4.1 LCD DISPLAY

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

- Partial register (5 figures with moving decimal point) indicating the volume dispensed since the reset button was last pressed
- Indication of battery charge

- Indication of calibration mode
- Totals register (6 figures with moving decimal point) indicating two types of Total:
4.1. General Total that cannot be reset
4.2. Resettable total (Reset TOTAL)

4.2 USERS BUTTONS
The METER features two buttons (RESET and CAL) which individually perform two main functions and, together, other secondary functions.

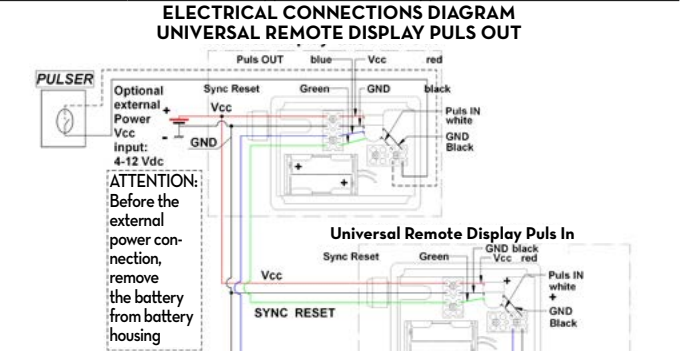
- For the RESET key, resetting the partial register and Reset Total for the CAL key, entering into configuration mode

Used together, the two keys permit entering configuration mode where the desired unit of measurement can be set.
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

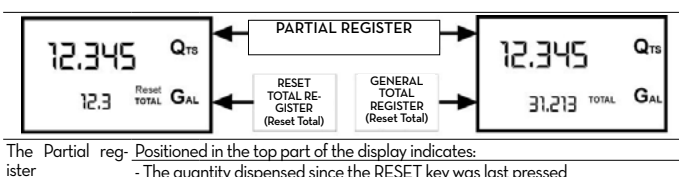
FOREWORD
The display has been designed for a fixed installation.
The display is equipped with a bracket that allows its rotation in order to reach the optimum position for reading. To connect the pulsar, loosen the 4 fixing screws of the rear lid, open the lid and insert the cable into the cable gland. The two electrical wires of the cable must be connected to a terminal (see photo) with two screws. Close the lid, ensuring that the o-ring is placed properly to guarantee a perfect seal. Below you find the scheme showing the connection between the remote display and the displaying repeater (Remote display with Puls In), where you can see the two possible versions: battery powered and externally powered.



ATTENTION:
Before the external power connection, remove the battery from battery housing

6 DAILY USE

FOREWORD
METER is delivered ready for use. No commissioning operations are required even after long storage periods. The only operations that need to be done for daily use are Partial and/or Reset Total register resetting. 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 Reset Total to general total display is automatic and tied to phases and times that are factory set and cannot be changed by the user.



The Partial register is positioned in the top part of the display indicators.

- 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 meter is programmed to show one or the other of the two Totals at very precise times:
- 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.

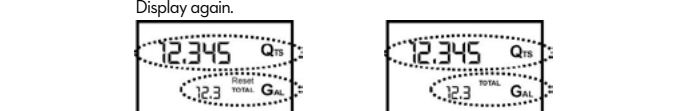
6 digits are available for Totals, plus two icons x 10 x 100. The increment sequence is the following:
0.0 - 99999.9 -> 999999 - 100000 x 10 -> 999999 x 10 -> 100000 x 100 - 999999 x 100

6.1 DISPENSING IN NORMAL MODE

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 Remote Display.



6.1.1 PARTIAL RESET

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 resettable total.

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

Schematically, the steps to be taken are:

- Wait for the display to show normal standby display page (with total only displayed)
- Press the reset key quickly
- The meter starts to reset the partial
- While the display page showing the reset total is displayed

Press the reset key again for at least 1 second

6.2 DISPENSING IN FLOW RATE MODE
FOREWORD
It is possible to dispense fluids, displaying at the same time:
- the dispensed partial
- the Flow Rate in (Partial Unit / minute) as shown on the following display page:

- wait for the Remote Display to go to Standby, meaning the display screen shows Total only
- quickly press the CAL key.

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

The flow rate is measured with reference to the unit of measurement of the Partial. For this reason, in case of the unit of measurement of the Partial and Total being different, as in the example shown below, it should be remembered that the indicated flow rate relates to the unit of measurement of the partial. In the example shown, the flow rate is expressed in Qts/min.

ATTENTION
When the Factory Factor is confirmed, the old User factor is deleted from the memory

7.2.2 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 Remote Display calibration, it is most important to:

- When the Factory Factor is confirmed, the old User factor is deleted from the memory
- Use a precise Sample Container with a capacity of not less than 5 litres, featuring an accurate graduated indicator
- Ensure calibration dispensing is done at a constant flow rate equivalent to that of normal use, until the container is full
- 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 keeping short bursts at constant operation flow rate)
- 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
- Carefully follow the procedure indicated below.

7.2.2.1 IN-FIELD CALIBRATION PROCEDURE
ACTION
1 NONE
METER in Standby

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 field calibration measurement operations**

LONG RESET key keying
The Meter shows "CAL" and the partial at zero. The Meter is ready to perform in-field calibration.

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 precise quantity.

6.2.1 PARTIAL RESET

To reset the Partial Register, finish dispensing and wait for the meter to show a Flow Rate of 0.0 as indicated in the FIGURE 1 then quickly press RESET (FIGURE 2)

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

7 CALIBRATION DEFINITIONS

Calibration 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:

Version for oil
Fluid Temperature: 20°C
Flow rate: 6-60 litres/minute

USER K FACTOR
Customized calibration factor, meaning modified by calibration. Even after any changes have been made by the user, the factory K factor can be restored by means of a simple procedure.

7.2 CALIBRATION MODE
Why calibrate
Remote Display METER 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 or high-viscosity oils for gearboxes)

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

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

Remote Display METER permits making quick and precise electronic calibration by changing the Calibration Factor (K FACTOR). Two procedures are available for changing the Calibration Factor:

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

The calibration phases can be entered by keeping the CAL key pressed for a long time) to s

Display the currently selected calibration factor

- Return to factory calibration (Factory K Factor) after a previous calibration by the user

- Change the calibration factor (using one of the two previously indicated procedures.

1- In calibration mode, the partial and total dispensed quantities indicated on the display screen take on different meanings according to the calibration procedure phase.

2- In calibration mode, the METER cannot be used for normal dispensing operations.

3- In "Calibration" mode, the totals are not increased.

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.

ATTENTION
When the Factory Factor is confirmed, the old User factor is deleted from the memory

7.2.1 DISPLAY OF CURRENT CALIBRATION FACTOR AND RESTORING FACTORY FACTOR.

By pressing the CAL key while the appliance is in Standby, the display page appears showing the current calibration factor used. 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 Q.998). The word "user" indicates a calibration factor set by the user is being used.

ATTENTION
When the Factory Factor is confirmed, the old User factor is deleted from the memory

7.2.2 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 Remote Display 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 keeping short bursts at constant 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

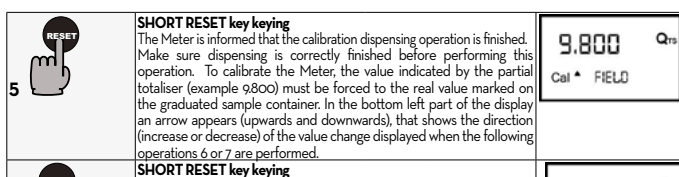
6 Carefully follow the procedure indicated below.

7.2.2.1 IN-FIELD CALIBRATION PROCEDURE
ACTION
1 NONE
METER in Standby

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 field calibration measurement operations**

LONG RESET key keying
The Meter shows "CAL" and the partial at zero. The Meter is ready to perform in-field calibration.

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 precise quantity.



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 partial register (example 0.000) 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.

SHORT RESET key keying
The arrow changes direction. The operation can be repeated to alternate the direction of the arrow.

SHORT/LONG CAL key keying
The indicated value changes in the direction indicated by the arrow one unit for every short CAL key keying, continually if the CAL key is kept pressed. The speed increase rises by keeping the key pressed. If the desired value is exceeded, repeat the operations from point 6).

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. The Meter calculates the new USER K FACTOR indicated value; this calculation could require a few seconds, depending on the correction to be made. **ATTENTION:** if this operation is performed after action 6), without changing the indicated value, the USER K FACTOR would be the same as the FACTORY K FACTOR, thus it is ignored.

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.

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.

7.2.3 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 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 * (100 - %e / 100)
EXAMPLE
Error percentage found: %e = 0.9 %
CURRENT calibration factor: 1.000

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

If 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).

ACTION
1 NONE
METER in Standby

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.

LONG RESET KEY KEYING
The Meter shows "CAL" and the partial at zero. The Meter is ready to perform in-field calibration by dispensing - see previous paragraph.

LONG RESET KEY KEYING
We now go on to Direct change of the calibration factor: the word "DIRECT" appears together with the Currently Used calibration factor. 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. The next operations 5 or 6 are performed.

SHORT RESET KEY KEYING
Changes the direction of the arrow. The operation can be repeated to alternate the direction of the arrow.

SHORT/LONG CAL KEY KEYING
The indicated value changes in the direction indicated by the arrow one unit for every short CAL key keying, continually if the CAL key is kept pressed. The speed increase rises

