AVAILABLE MODELS:

MANUFACTURER:

Important pre-

Symbols used

NOTICE

Manual pres-

ervation

MACHINE AND MANUFACTURER

PIUSI Suzzara (Mn) Italy

0722 II2G | Ex ia IIB T4 Gb

mod. **F00408Nnn** LN **12345678**

To ensure operator safety and to protect the meter from po-

tential damage, workers must be fully acquainted with this instruction manual before performing any operation.

he following symbols will be used throughout the manual

to highlight safety information and precautions of particular

WARNING indicates a hazardous situation which, if not

NOTICE is used to address pratices not related to per-

This manual should be complete and legible throughout. It

should remain available to end users and specialist installa-

tion and maintenance technicians for consultation at any

voided, could result in death or serious injury

Via Pacinotti 16/A – z.i. Rangavino

IECEX CES 13.0021X

CESI 13 ATEX 049 X

PIUSI S.p.A.,

GENERAL WARNINGS

sonal injury

IDENTIFICATION

ENGLISH (Translated from Italian)

ELECTRONIC ALLUMINIUM TURBINE METER



0.000

(,0.0

12,345

12.5

the Flow Rate in [Partial Unit / minute] as shown on the

Procedure for entering this mode:

wait for the Remote Display to go to Standby, meaning the

display screen shows Total only

quickly press the CAL key.

unstable at lower flow rates. The higher the flow rate, the more stable the displayed The flow rate is measured with reference to the unit of measurement of the Partial. For this reason, in case of

12.345

the unit of measurement of the Partial and Total be-ing 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.

(12.5

which are again displayed when exiting from the flow

rate reading mode. CAL is accidentally pressed during the count, this will have no effect.

▶ NOTICE

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

H.2.1 PARTIAL RESET (FLOW RATE MODE)



When operating close to extreme use or flow rate conditions (close to minimum or \max mum acceptable values), an on-the-spot calibration may be required to suit the real condi-

factor can be restored by means of a simple procedure. **USER K FAC-** Customized calibration factor, meaning modified by calibration

vious calibration by the user Change the calibration factor using one of the two previously indicated procedures Two procedures are available for changing the Calibration

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

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

ally perform two main functions and, together, other secondary func for the RESET key, resetting the partial register and Reset Total - for the CAL key, entering instrument calibration mode

Used together, the two keys permit entering configuration mode CALIBRATE MEANS PERFORMING ACTIONS ON THE METER

The METER features two buttons (RESET and CAL) which individu

SECONDARY FUNCTIONS where the desired unit of measurement can be set. KEYS. BELOW IS THE LEGEND OF THE SYMBOLS USED TO DESCRIBE THE ACTIONS TO BE PERFORMED SHORT

PRES-SURE OF CAL OF CAL

OPERATING MODES

PRES-SURE OF RESET

ENGLISH (Translated from Italian)

he measurement electronics and the LCD display are fitted in the top part of the K24 which remains isolated from the fluid-bath measurement chamber and sealed from the outside by means of a cover. Normal Mode: Mode with display of Partial and Total dispensed quanti-

The user can choose between two different operating modes:

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

The meter features a non-volatile memory for storing the dispensing

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

INSTALLATION

Installation, assembly and maintenance operations of the K24, must only be performed by personnel quali-fied to operate in HAZARDOUS LOCATIONS ZONE1. WARNING fied to operate in HAZARDOUS LOCATIONS ZONEI.

K24 features a threaded, perpendicular inlet and outlet
(1" NPT or BSP male and female that can be combined
together). It has been designed to be easily installed
in any position: fixed in-line or mobile on a dispensing
nozzle. In order to improve the life of the turbine, it is
recommended to fit a strainer before the meter itself
For installations on system, position meter so that the
battery housing can be easily reached.

To protect against the leakage, make sure all threads
are sealed with two or three turns of thread tape or a
sealing compound compatible with the liquid being CONNECTIONS sealing compound compatible with the liquid being netered

Make sure the thread tape or sealing compound doe interfere with flow take sure there are no leaks in the connections. To seal leaks, remove and inspect the meter and replace the thread tape or sealant. Refer to the Troubleshooting

To minimize static electricity build up,use only static conductive hose R:1M·m when metering flammable fluids, and keep the fill nozzle in contact with the conainer being filled during the filling process. All parts of our system must be incontinuity and

DO NOT exceed 145 psi - 20 bar line pressure. DO NOT install additional foot valve or check valve without a pressure relief valve; otherwise the meter

The electrical signal between K24 PULSER and the control unit device must be protected by intrinsical

The electrical limits of signal are the follows : Ui = 12 V li = 100 mA

Pi = 0.3 W

The barier must be properly connected to an eartl Improper installation of this meter and barier could re sult in death or serious injury.

DAILY USE

CONNECTIONS

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 K24. Occasionally the meter may need to be configured or calibrated. To do so, please refer to the relevant

chapters. Below are the two typical normal operation displays. One display page shows the partial and reset total registers. The other shows the partial and general total. Switchover from resettable total to general total display is automatic and tied to phases and times that are

in factory set and cannot be changed.

Registro del PARZIALE 12.345 31.213 TOTAL G. 6 digits are available for Totals, plus two icons x 10 /

x100. The increment sequence is the following: NOTICE 0.0 -> 99999.9 -> 9999999 -> 100000 x 10 -> 9999999 x 10

H.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

Should one of the keys be accidentally pressed during dispensing, this will have no effect. NOTICE 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 until the user operates the k24 again.



H.1.1 PARTIAL RESET (NORMAL MODE)

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

23412.3 TOTAL G.

H.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 displa 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) 2 Press the reset key quickly 3 The meter starts to reset the partial 4 While the display page showing the reset total is displayed Press the reset key again for at least 1 second The display screen again shows all the segments of th

H.2 DISPENSING WITH FLOW RATE MODE DISPLAY

display followed by all the switched-off segments and fi-

nally shows the display page where the reset Reset Total

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

following display page:

3 Start dispensing

The flow rate is updated every 0.7 seconds. Consequently, the display could be relatively

The word "Gal" remaining alongside the flow rate re-fers to the register of the Totals (Reset or NON Reset)

To return to "Normal" mode, press the CAL key again. If one of the two keys RESET or

To reset the Partial Register, finish dispensing and wait for the Remote Display to show a Flow Rate of 0.0 as indicated in the illustration

then quickly press RESET

CALIBRATION

tions in which the K24 is required to operate.

I.1 DEFINITIONS

"K FACTOR" FACTORY K **FACTOR**

Fluid Diesel
Temperature: 20°C - 68°F

the general total. This situation is called standby and remains stable

12,345 Q₁₅ GAL

23412.3 TOTAL GAL 0.000 Q15 23412.3 Hessel GA 23412.3 TOTAL C 12.345 CESTAGE E'STREZ' 0.0002345.61 Reset GAL

MACHINE AND MANUFACTURER IDENTIFICATION GENERAL WARNINGS SAFETY INSTRUCTIONS DEFINITION OF CLASSIFIED ZONES

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GENERAL SAFETY RULES PACKAGING
PACKAGE CONTENTS/PRE-INSPECTION BECOMING ACQUAINTED WITH K24 COMPATIBLE LIQUIDS DISPLAY LCD
DISPLAY POSITIONING (METER VERSION ONLY) E.4 USERS BU OPERATING MODES **USERS BUTTONS** INSTALLATION

INTENDED USE

FIRST AID RUI ES

(2014/34/UE, Annex X)

PIUSI S.p.A.

F00408N*nn

K24

(*N = X : Meter version : N = Y : Pulser version)

EN 6007911-0:2012 / A11:2013; IEC 60079-11:2011

nent is classified as follows

Suzzara, 20/04/2016

Name: CESI S.p.A.

Notified body data: name, identification number and address

Read the Use and Maintenance manual before using the meter.

PIUSI S.p.A.

under its own responsibility, that the equipment described below:

in conformity with the legal provisions indicated in the directives :

Electromagnetic Compatibility Directive 2014/30/EU

PIUSI S.p.A.

Declares under its own and sole responsibility that the machine:

F00408N*nn

Notified body data: name, identification Number and address

Address: Via Rubattino, 134 - 20134 - Milan

Read the Use and Maintenance manual before using the pump.

K24

(*N = X : Meter version : N = Y : Pulser version)

EC 60079-0:2011; IEC 60079-11:2011

Name: CESI S.p.A.

e equipment is classified as follows:

Ex ia IIB T4 (135°C) Gb

Identification number: 0722

CoC Certificate Number: IECEX CES 13.0021X

Suzzara, 20/04/2016

Address: Via Rubattino, 134 - 20134 - Milano

Number of the EC type-examination certificate: CESI 13 ATEX 049 X

2014/34/UE

EN 60079-0:2012 ; IEC 60079-0:2011

(135°C) Gb

HEREBY STATES

Model: K24

Description: METER

Varini as legal representative.

The manufacturer::

the product.

specifications:

Suzzara, 20/04/2016

46029 Suzzara (MN) Italy

and the following harmonized standards, applied standards and/or technical specifica-

A.2 EC DECLARATION OF CONFORMITY (2014/30/EU)

Serial number: refer to Lot Number shown on CE label affixed to product Year of manu-

facture: refer to the year of production shown on the CE label affixed to the product is

The documentation is at the disposal of the competent authority following motivated

1.3 DECLARATION OF CONFORMITY IECEX

46029 Suzzara (MN) Italy

Via Pacinotti, 16/A z.i. Rangavino

Year of manufacture: refer to the year of production shown on the CE plate affixed to

omply with all the following harmonized standards, applied standards and/or technical

request at Piusi S.p.A. or following request sent to the email address: doc tec@piusi.com

ne person authorised to compile the technical file and draw up the declaration is Otto

Via Pacinotti, 16/A z.i. Rangavino

46029 Suzzara (MN) Italy

The manufacturer:

DAILY USE DISPENSING IN NORMAL MODE PARTIAL RESET (NORMAL MODE) RESETTING THE RESET TOTAL DISPENSING WITH FLOW RATE MODE DISPLAY H.2 PARTIAL RESET (FLOW RATE MODE) CALIBRATION

DEFINITIONS CALIBRATION MODE DISPLAY OF CURRENT CALIBRATION FAC-AND RESTORING FACTORY FACTOR. IN FIELD CALIBRATION 1.2.2 IN-FIELD CALIBRATION PROCEDURE

I.2.2.1 IN-FIELD CALIBRATION PROCEI DIRECT MODIFICATION OF K FACTOR METER CONFIGURATION **MAINTENANCE** Reproduction MAI FUNCTIONS

DECLARATION OF CONFORMITY (94/9/CE, Annex X, lett. B)

DECLARATION OF CONFORMITY (2004/108/EC)
DECLARATION OF CONFORMITY IECEX

This manual belongs to Piusi S.p.A., which is the sole propr etor of all rights indicated by applicable laws, including, by DISPOSAL way of example, laws on copyrights. All the rights deriving TECHNICAL DATA from such laws are reserved to Piusi S.p.A.: the reproduction, including partial, of this manual, its publication, change, tran-EXPLODED VIEWS AND OVERALL DIMENSIONS scription and notification to the public, transmission, includ ing using remote communication media, placing at disposal of the public, distribution, marketing in any form, translation **CONFORMITY** and/or processing, loan and any other activity reserved by

Installation, assembly and maintenance operations the K24, must only be performed by personnel qualif to operate in HAZARDOUS LOCATIONS ZONE. **DECLARATION OF CONFORMITY** BEFORE PROCEEDING WITH THE REFUELLING OF THE AIRCRAFT, ENSURE THAT THE SYSTEM IN-Via Pacinotti, 16/A z.i. Rangavino TENDED FOR SUCH ACTION COMPLIES WITH THE Declares under its own and sole responsibility that the machine: REGULATIONS IN FORCE IN THE COUNTRY OF USE Stop operation immediately if static sparking occurs or if you feel a shock. Do not use equipment until you ntify and correct the problem. dentify and correct the provinces.
Keep a working fire extinguisher in the work area.
Do not operate the unit when fatigued or under the in-Year of manufacture: refer to the year of production shown on the CE plate affixed to comply with all relevant provisions of the following directives:

uence of drugs or alcohol. o not alter or modify equipment. Alterations or mo ations may void agency approvals and create safety Keep children and animals away from work area.
Comply with all applicable safety regulations.

SAFETY INSTRUCTIONS SAFETY WARNINGS

WARNING

Motorin

Legal Representative

Motorin

legal representative.

Motorin

Legal Representative

Otto Varini

Otto Varini

Otto Varini

You must avoid any contact between the electrical power supply and the fluid that needs to be FILTERED. 1AINTENANCE CONT efore any checks or maintenance work are carrie

ains - preliminary checks before installation

FOR YOUR SAFETY, REVIEW THE MAJOR WARNINGS AND CAUTIONS BE-LOW BEFORE OPERATING YOUR METER When metering flammable liquids, observe precautions against fire or explosion When handling hazardous liquids, always follow the liquid manifacturer's safety precautions
Always dispose of used cleaning solvents in a safe manner according to the solvent manifacturer's in-

onnect the power source.

uring meter removal, liquid may spill. Follow the iquid manifacturer's safety precautions to clean up Do not blow compressed air through the meter
Do not allow liquids to dry inside the meter

Jse onlu liquids permitted D.2 DEFINITION OF CLASSIFIED ZONES (EN60079-10-1)

FOREWORD Definition of zones as shown in directive 99/92/CE Place where an explosive atmosphere made up of a mix of air and in flammable substances in the form of gas, vapour or mist is continuously

present, either for long periods or frequently. lote: Generally speaking, said conditions, when they occur, involve the inside of tanks, pipes and containers, etc. where it is probable that an explosive atmo a mix of air and inflammable substances in the form of gas, vapour or

Note: Said zone can also include: places in the immediate vicinity of zone O; places in the immediate vicinity of supply openings; places in the immediate vicinity of filling and and emptying openings; places in the immediate vicinity of appliances, protection systems and

ragile glass and ceramic components, or components made of other simiplaces in the immediate vicinity of inadequately sealed stuffing boxes, e.g., on pumps and valves with stuffing box. Place where it is improbable that an explosive atmosphere, made up of a mix of air and inflammable substances in the form of gas, vapour or mist, can occur during normal operation, but which, if it does occurs,

mist, can occur occasionally during normal operation.

only persists for a short time. Note: Said zone can include, among others, places surrounding the zones

Place where an explosive atmosphere in the form of a cloud of combustible powders in the air is continuously present, either for long periods or frequently. Note: Generally speaking, said conditions, when they occur, involve the nside of tanks, pipes and containers, etc.

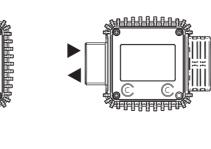
Place where it is probable that an explosive atmosphere in the form of a

ZONE 21 cloud of combustible powders in the air, can occur occasionally during nor-Note: Said zone can include, for example, among others, places in the mmediate vicinity of powder loading and emptying points and places where powder layers form or which, during normal operation, could produce an explosive concentration of combustible powders mixed with the air.

PACKAGE CONTENTS/PRE-INSPECTION

scribed below are missing from inside the package, please contact Piusi S.p.A. technical support. 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

3 - description of the



E.4 USERS BUTTONS

FOREWORD

FUNCTIONS

PERFORMED

PRES-

KEY

K24 is a bi-directional meter with LCD display and calibration buttons. The body is made of aluminum (conductive) and designed for high flow 120 l/min. (32 GPM). Do not use K24 for purposes other than those intended.

-AVGAS 100/100LL - JETA/A1

ENGLISH (Translated from Italian)

BECOMING ACQUAINTED WITH K24

signed for precise measuring of low viscosity fluids.

FOREWORD Electronic digital meter featuring a turbine measurement system, de-

- PETROL - PETROL ALCOHOL MIXED MAX 20% (E20)

DO NOT USE WITH SUNDRIES LIQUIDS

em «Compatible liquids».

The K24 flow meter has been designed and made for

the precise measurement of pumped liquids, including

nder high pressure. Use only the liquids listed under the

Using the system for purposes other than those intended and indicated under "Intended use" is strictly forbid

All other uses excepting those for which the litre counter was designed and described in this manual shall be deemed "MISUSE", and consequently Piusi S.p.A. disclaims all liability for any injury caused to persons of animals or damage to things or the system itself.

The K24 flow meter IS NOT compatible with the follo

All fluids of group **IIC**, **IC** (definition like IEC60079-0)

All fluids not suitable with alluminum, PA (polyammide)

4 Technical data plate

PULSER

Not suitable with explosive dust (IIIC)

3 CAL key

PBT (Polybutylene terephthalate).

E.2 DISPLAY LCD (METER VERSION ONLY)

tion so requires.

comma FROM 0.1 to 99999) indicating

the volume dispensed since the reset

comma FROM 0.1 to 999999), that

can indicate two types of Total:

4.1. General Total that cannot be reset

4.2. Resettable total (Reset TOTAL)

5 Indication of total multiplication factor

(x10 / x100)

button was last pressed

2 Indication of battery charge

FOREWORD The "LCD" of the METER features two numerical registers and vari-

Partial register (5 figures with moving 6 Indication of type of total, (TOTAL /

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

QTS PTS L GAL

E.3 DISPLAY POSITIONING (METER VERSION ONLY)

using, thus ensuring great versatility in positioning

hat fix both the cover and the card (1).

This allows easy display readings in any position. The card housing is closed by a plastic cover sealed through a rubber protection acting as

a gasket as well. This can be easily removed unscrewing the 4 screws

While fixing the K24 card, make sure the battery con-

tact cable is not placed above the circular housing of

ous indications displayed to the user only when the applicable func-

7 Indication of unit of measurement of

Totals: L=Litres Gal=Gallons

8 Indication of Flow Rate mode

Partial: Qts=Quarts Pts=Pints

Gal=Gallons

L=Litres

WARNING

COMPATIBLE LIQUIDS E.1 Turbine The turbine is placed inside a hole through the body of k24, fitted with M-f threaded inlet and outlet. The liquids compatible with k24 are at low viscosity, namely: COMPATIBLE - DIESEL - KEROSENE

LIQUIDS

WARNING

ININTENDED USE

NOT COMPATIBLE

LCD display

2 RESET key

Marking

INTENDED USE

ZONE 22

METER FOR TRANFERRING FUEL SUITABLE FOR OPERATING IN ZONES CLASSIFIED"1"AND "2", AC-CORDING TO DIRECTIVE 99/92/CE THE DETERMINATION OF THE AREAS (ZONES) IS TO

E CARRIED OUT BY THE USER Using the appliance for fluids other than those listed at paragraph "COMPATIBLE LIQUIDS" and for uses other than those described at the item "authorised use"

ENGLISH (Translated from Italian)

deposits).

D.3 INTENDED USE

WARNING

INTENDED USE

FORBIDDEN USE

ZONE 1

Place where it is improbable that an explosive atmosphere, in the form

of a cloud of combustible powders in the air, occur during normal op-

Note: This zone can comprise, among others, places near appliances

protections systems and components containing powder, out of which the powder can come out due to leaks with the formation of powder

posits (e.g., milling salt, where the powder comes out of the mills and

eration but which, if it does occur, only persists for a short time.

ZONE o

PLANT OPERATION RESTRICTIONS IT IS FORBIDDEN: To use the appliance in a construction configuration other than that contemplated by the manufacturer To use the appliance with fixed guards tampered with To use the appliance in places where there is risk of explosion and/or fires classified in the following zones:

); 20; 21; 22 To integrate other systems and/or equipment not con sidered by the manufacturer in the executive project. To connect the appliance up to energy sources other than those contemplated by the manufacturer
To use the commercial devices for purposes other than those indicated by the manufacturer.

Do not use in case of lightnings

D.4 FIRST AID RULES Contact with In the event of problems developing following EYE/SKIN CONTACT, INHALATION or INGESTION of the treated

the product product, please refer to the SAFETY DATA SHEET of the fluid handled. NOTICE Please refer to the safety data sheet for the product

SMOKING When operating the dispensing system and in particular dur-PROHIBITED (ing refuelling, do not smoke and do not use open flame. hen metering flammable liquids, observe precauions against fire or explosion When handling hazardous liquids, always follow the quid manifacturer's safety precautions. WARNING

GENERAL SAFETY RULES Essential pro-Wear protective equipment that is: suited to the operations that need to be performed;

resistant to cleaning products.

teristics Personal pro-Wear the following personal protective equipment during handling and installation: safety shoes: be worn ose-fitting clothing;

ment charac

otective gloves;







instruction manual

WARNING

FOREWORD

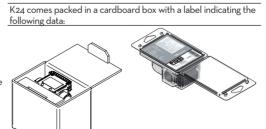
1 - contents of the

2 - weight of the

package

handling hazardous liquids, always follow the Liquid anifacturer's Safety Precautions. Wear protective lothing such as goggles, gloves and respirator as structed. When metering flammable liquids, observe precautions against fire or explosion. Do not meter in the presence of any source of ignition including running or hot en-gines, lighted cigarettes, or gas or electric heaters

D.6 PACKAGING



In the event that one or more of the components de-

NOTICE

12.345 Reset G

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

12.345

The K24 features a non-volatile memoru 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 bat-

CALIBRATION Multiplication factor applied by the system to the electrical pulses FACTOR OR received, to transform these into measured fluid units. Factory-set default factor. It is equal to 1,000. This calibration factor ensures utmost precision in the following operating conditions:

Fluid Diesol

Flow rate: 50 lit/min (13 GPM)

I.2 CALIBRATION MODE Display the currently used calibration factor: Return to factory calibration (Factory K Factor) after a pre-

In-Field Calibration, performed by means of a <u>dispensing operation</u> irect Calibration, performed by directly changing the calibration 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 K24 cannot be used for normal dispensing operations. In "Calibration" mode, the totals



Use, maintenance and Calibration manual **BULLETIN MO320 A EN OO** O DISPOSAL

Foreword

ic components

tion re-

garding

ing within the Eu-

the envi-

ropean Union

parts disposal

Flow Rate (Range)

perating pressure (Max)

Bursting pressure (Min)

orage humidity (Max) Operating temperature (Range)

Reproducibility (Typical)

I.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 fac-tor used. If no calibration has ever been Cal FRCT performed, or the factory setting has been estored after previous calibrations, the

following display page will appear: shows that the factory calibration factor is being used

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



The flow chart alongside shows the switchover logi from one display page to In this condition, the Reset key permits switching from User factor to Factory fac-

To confirm the choice of calibration factor, quickly press CAL while "User" or 'Fact" are displayed. After the restart cycle, the K24 uses the calibration factor that has just been confirmed

Ø 12.345 23412.3 E.SIPES When the Factory Factor is confirmed, the old User factor is deleted from the memory

1.000

12.345

I.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 precisio

For correct K24 calibration, it is most important to:

NOTICE

NOTICE

When the Factory Factor is confirmed, the old User factor is deleted from the memor 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 equiva-

lent 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 making short

top-ups at normal 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.

6	Carefully follow the procedure indicated below.	
1.2.2.1	IN-FIELD CALIBRATION PRO	CEDURE
ACTION		DISPLAY
1	NONE Meter in Standby	12,345 L 1345 TOTAL L
GAL AL LE	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	1,000 L cal FRCT (USER) L
meset set and	LONG RESET key keying The Meter shows "CAL" and the partial at zero. The Meter is ready to perform in-field calibration.	O.OOO L Cal FIELD
4	DISPENSING INTO SAMPLE CONTAINER Without pressing any key, start dispensing into the sample container Dispensing can be interrupted and started again at will. Continue dispensing until the level of the fluid in the sample container has reached the graduated area. There is no need to reach a preset quantity. 9.800 L Cal. 0.0000 L Indicated value Real value	9.800 L Cal FIELD
5	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 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.	9.800 L cal FIELD
_		

midfal	The Meter enters calibration mode, shows «CAL» and displays the calibration factor in use instead of partial. The words "Fact" and	COCT	L
2 9 9 9	"USER" indicate which of the two factors (factory or user) is currently in use.	Cal (USER)	L
	Important: This factor is that which the instrument also uses for field calibration measurement operations		
RESET SET LET	LONG RESET key keying The Meter shows "CAL" and the partial at zero. The Meter is ready to perform in-field calibration.	Cal FIELD	L
4	DISPENSING INTO SAMPLE CONTAINER Without pressing any key, start dispensing into the sample container	9.800 cal FIELD	L
	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 cal. 0.0000 L		
ESST	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 partial	9.800 cal FIELD	L
Š	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.		
RESET	SHORT RESET key keying The arrow changes direction. The operation can be repeated to alternate the direction of the arrow.	9.800 cal▼ FIELD	L
7 CAL CAL AL 11	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	9.860 cal A FIELD	L
- Milit	the operations from point (6).		
RESET SET LET	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	L
	9.860 L cal * FRCT		

Indicated value Real value ne Meter calculates the new USER K FACTOR : this calculati e 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 me as the FACTORY K FACTOR, thus it is ignored.

MAINTENANCE At the end of the calculation, the new USER K FACTOR is shown 1.015 for a few seconds, after which the restart cycle is repeated to fine

BATTERY Use only Piusi Battery code *18021 REPLACEMENT To reduce risk of ignition of a flammable or explosiv atmosphere do not use Volt meter or smiliar powere tools during the live maintenance.



I.2.3 DIRECT MODIFICATION OF K FACTOR f 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 calcu-

0.000

12.345

13456 TOT

1.000

1.000

1.000

Cal ▼ DIRECT

1.003

Cal▲ DIRECT

Cal END

1.003

Cal END

0.000

Litres (L)

Gallons (Gal)

Gallons (Gal)

Gallons (Gal)

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

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

UNIT

By pressing the CAL key at length, the new settings will be stored, the METER will pass through the start cycle and

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 Mea-

13456 TOTAL

Cal FIELD

1.000

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

calibration factor used by the Meter and will continue to remai

The Meter stores the new work calibration factor and is read to begin dispensing, using the USER K FACTOR that has just

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

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

f the Meter indicates less than the real dispensed value (negative error) the new cali-

libration factor being used instead of the partial. The words "Fact"

and "User" indicate which of the two factors (factory or user)

eter is ready to perform in-field calibration by dispensing -

We now go on to Direct change of the calibration factor: the wor Direct" appears together with the Currently Used calibration factor

vards) defining the direction (increase or decrease) of chang

the displayed value when subsequent operations 5 or 6 are

e indicated value changes in the direction indicated by the arrow ne unit for every short CAL key keying

eeping the key pressed. If the desired value is exceeded, repeat

ontinually if the CAL key is kept pressed. The speed increase

Before performing this operation, make sure the INDICATED valu

At the end of the calculation, the new USER K FACTOR is shown

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

calibration factor used by the Meter and will continue to remain

The Meter stores the new work calibration factor and is ready begin dispensing, using the USER K FACTOR that has just bee

The METER feature a menu with which the user can select the main measurement

this example Litres / Litres)

UNIT

UNIT

unit, Quarts (Qts), Pints (Pts), Litres (Lit), Gallons (Gal); The combination of the unit of measurement of the Partial register and that of the Totals is predefined

> Unit of Measuren Partial Register Litres (L)

Gallons (Gal)

Ouarts (Ots)

Pints (Pts)

for a few seconds, after which the restart cycle is repeated to final

Changes the direction of the arrow. The operation can be repeate

n the bottom left part of the display, an arrow appears (upwards or Cal A DIRECT

ne Meter shows "CAL" and the zero partial total.

bration 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).

such even after a battery change

lated by the operator in the following way

Error percentage found: E% - 0.9 %

CURRENT calibration factor: 1.000

METER in Standby.

ONG CAL KEY KEYING

ous paragraph.

LONG RESET KEY KEYING

SHORT RESET KEY KEYING

alternate the direction of the arrow.

SHORT/LONG CAL KEY KEYING

LONG RESET KEY KEYING

such even after a battery change

METER CONFIGURATION

NO OPERATION

NO OPERATION

according to the following table

CAL AL AL

NOTICE

K24 should be installed in a position allowing the bat-teries to be replaced without removing it from the BATTERIES Check the batteries and terminals at least every year to ensure proper operation. It is strongly recommended that terminals be cleaned annually

12.345 23412.3 TOTAL G. will prevent operation. In this condition the battery icon

When the battery charge falls below the first level on the LCD, the fixed battery symbol appears. In this condition. K24 continues to operate correctly, but the fixed icon warns the user that it is ADVISABLE to change the bat-If K24 operation continues without changing the batteries, the second battery alarm level will be reached which

starts to flash and is the only one to remain visible on the

The warranty and the safety of the product is insured only with the use of battery Piusi code *18021 PIUSI S.p.A. DENIES LIABILITY FOR DAMAGES CAUSED

BY THE USE OF BATTERIES NOT SUITABLE.

WARNING

TO REMOVE 1

BATTERY

During meter removal, liquid may spill. Follow the liq-uid manifacturer's safety precautions for clean up of inor spills. Ensure all liquid is drained from the meter. This could include draining the hose, meter, nozzle or pipe Wear protective clothing as necessary, loosen both er of the meter. Use a wrench only on the meter's flat metal If the meter is not immediately installed again, cap the hose end or pipe to prevent spills To reduce the risk of ignition of a flammable or explo-sive atmosphere, batteries must only be changed in a

To prevent ignition of flammable or combustibile atospheres, disconnect power before servicing To change the Press RESET to update all the totals batteries, with

Loosen the 4 fixing screws of the lower cover Remove the old batteries and disconnect the plug Place the new batteries in the same position as the old ones the exploded diagram posi sure to put the battery in the correct way) tions, proceed as Close the cover again, by positioning the rubber protection as a gasket K24 will switch on automatically and normal operation can

The K24 will display the same Reset Total, the same Total and the same Partial ndicated before the batteries were changed. After changing the batteries, the meter does not need calibrating again. CLEANING Only one operation is necessary to clean the k24. After removing k24 from the plant where it was built in, any re-

WARNING TO STORE

rotation of the turbine, it will have to be replaced.

Do not discard the old batteries in the environment. Refer to local disposal regulations. Do not use compressed air onto the turbine in order to avoid its damage because of an excessive rotation Follow the liquid manifacturer's instructions for the disposal of contaminated cleaning solvents

sidual elements can be removed by washing or mechani-

cally-handling. If this operation does not restore a smooth



Carefully remove the screws from the corners of the front panel, and then carefully lift the front cover up way from the main body of the meter.



Carefully remove the screws from the corners of the front panel, and then carefully lift the front cover up away from the main body of the meter.



When the new panel is fitted make sure the power adapter is fitted correctly with the location pin in the correct



Carefully refit the display panel back onto the main body making sure the wire is tucked into the corner and replace the screws

MALFUNCTIONS (EN60079-19)

Problem	Possible cause	Remedial Action
LCD: no indication	Bad battery contact	Check battery contacts
Not	Wrong K FACTOR	With reference to paragraph H check the K FACTOR
Not enough mea- surement precision	The meter works below minimum acceptable flow rate.	Increase the flow rate until an ac ceptable flow rate range has been achieved
Reduced or zero flow rate	TURBINE blocked	Clean the TURBINE
The meter does not count, but the flow	Incorrect installation of gears after cleaning	Repeat the reassembly procedure
rate is correct	Possible electronic card prob- lems	Contact your dealer
K24 is switched of		Check battery charge and/o

If the system needs to be disposed, the parts which make it up

must be delivered to companies that specialize in the recycling

he packaging consists of biodegradable cardboard which can be

These must be disposed of by companies that specialize in the

marked with this symbol on the product and/or packaging not

be disposed of together with non-differentiated urban waste. The symbol indicates that this product must not be disposed of

the owner to dispose of these products as well as other electric

or electronic equipment by means of the specific refuse collec-

tion structures indicated by the government or the local governing

Disposing of RAEE equipment as household wastes is strictly for-

Any hazardous substances in the electrical and electronic appl

serious consequences for the environment and human health.

ances and/or the misuse of such appliances can have potentially

In case of the unlawful disposal of said wastes, fines will be ap-

Other components, such as pipes, rubber gaskets, plastic parts

and wires, must be disposed of by companies specialising in the

0.006 gall./pulse

1450 (psi

-4 · 158 (°F)

0.30 Bar at 100 lit/min. 4.35 psi a 26.41gal/mii

0-90 (litres/min) 2,65-23,8 (gallons/min) range

bidden. Such wastes must be disposed of separately.

plicable as defined by the laws in force.

0.010 lit/pulse

· 120 (Lit/mir

-10 · + 50 (°C)

2 · 5.35 cSt/ pulse

- 5-figure partial

li = 100 mA

Pi = 0.3 W

±% after calibration with

iquid crystals LCD. Featuring:

0.4 Kg (included batteries)

6-figure Reset Total plus x10 / x100

6-figure non reset Total plus x10 / x100 Lithium battery PIUSI code *18021

disposal of industrial waste.

TECHNICAL DATA

orage temperature (Range) |-20 · + 70 (°C)

ogether with normal household waste. It is the responsibility of

tions of directive 2012/19/CE (see text of directive below).

Informa- European Directive 2012/19/EC requires that all equipment

and disposal of industrial waste and, in particular:

packing materials delivered to companies for normal recycling of cellulose.

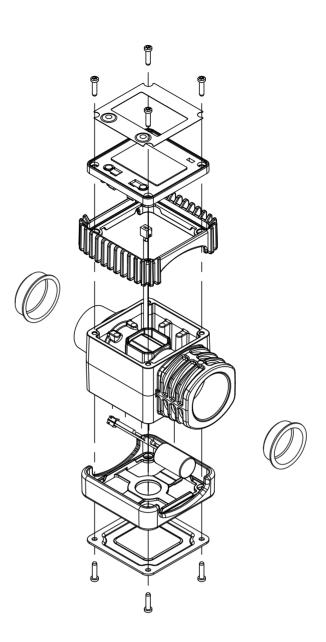
consigned to scrap metal collectors.

Metal Parts Dis- Metal parts, whether paint-finished or in stainless steel, can be

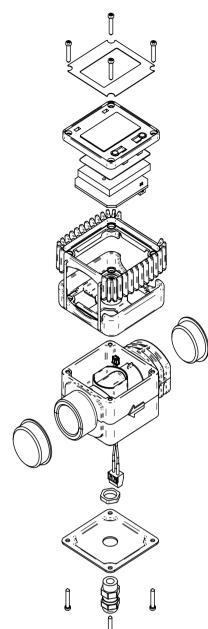
tric and electron- disposal of electronic components, in accordance with the indica-

EXPLODED VIEWS AND OVERALL DIMENSIONS

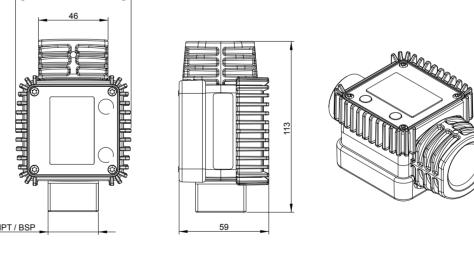
METER



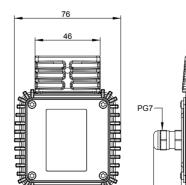
PULSER







PULSER



1" NPT / BSP

