

ENGLISH (Translated from Italian)

INDEX

- 1 FACSIMILE COPY OF EU DECLARATION OF CONFORMITY
2 GENERAL WARNINGS
3 SAFETY INSTRUCTIONS
...
13 FACSIMILE COPY OF EU DECLARATION OF CONFORMITY

FACSIMILE COPY OF EU DECLARATION OF CONFORMITY

The undersigned: PIUSI S.p.A.
Via Rasnotti 16/A - 21. Rangovico - 46029 Sassara - Mantova - Italy
...
THE ORIGINAL DECLARATION OF CONFORMITY IS PROVIDED SEPARATELY WITH THE PRODUCT

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.
...
This symbol indicates safe working practices for operators and/or potentially exposed persons.

SAFETY INSTRUCTIONS

3.1 SAFETY WARNINGS
Main - preliminary checks before installation
Maintenance control
FIRE AND EXPLOSION
...
3.2 FIRST AID RULES
When operating the system and in particular during refueling, do not smoke and do not use open flame.

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.

PACKAGING

K600 COMES PACKED IN A CARDBOARD BOX WITH A LABEL INDICATING THE FOLLOWING DATA:
1 - contents of the package
2 - weight of the contents
3 - description of the product

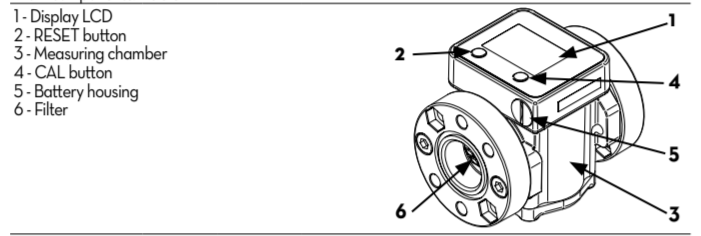
ENGLISH (Translated from Italian)

PACKAGE CONTENTS/PRE-INSPECTION

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

KNOWLEDGE K600

FOREWORD K600 - meter and pulser versions - represents a family of meters developed to satisfy a wide range of requirements for the control, measurement, dispensing and transfer of lubricating oils and fuels.
...
COMPATIBLE LIQUIDS
- DIESEL FUEL at a viscosity from 2 to 5,35 cSt (at a temperature of 378°C). Minimum Flash Point (P.M.) 55°, according to UNI EN 590
- MOTOR OIL, SYNTHETIC / MINERAL (GLT/BLT/CT/PLT) according to the EN 590/2019



Main components: K600
1- Display LCD
2- RESET button
3- Measuring chamber
4- CAL button
5- Battery housing
6- Filter

LCD DISPLAY (ONLY METER VERSION)

The LCD of the METER features two numerical registers and various indications displayed to the user only when the applicable function is required.
1 - Partial register (5 figures with moving comma)
2 - Indication of battery charge
3 - Indication of calibration mode
...
6.1 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".

Measurement Chamber
The measuring chamber is located in the lower part of the instrument. It is fitted with connections for the installation of threaded flanges at inlet and outlet.
...
6.2 DISPENSING IN FLOW RATE MODE
It is possible to dispense, displaying at the same time:
- the dispensed partial
- the Flow Rate in (Partial Unit / minute) as shown on the following display page.

Battery housing
The METER is powered by two standard type 15 V batteries (size N). The battery housing is closed by a threaded watertight cap that can be easily removed for quick battery change.

VERSION PULSER

The PULSER version is a pulser emitter (reed bulb) which translates the magnetic field variations generated by gear rotation into electric pulses to be sent to an external receiver. The receiver is to be connected according to the enclosed diagram. The pulser does not need any independent electric power supply as it is directly powered by the receiver connection.
...
4.3 USERS BUTTONS
The METER features two buttons (RESET and CAL) which individually perform two main functions:
- the RESET key, resetting the partial register and Reset Total
- the CAL key, entering instrument calibration mode

MAIN FUNCTIONS PERFORMED SECONDARY FUNCTIONS LEGEND
Short pressure of cal key
Long pressure of cal key
Short pressure of reset key
Long pressure of reset key

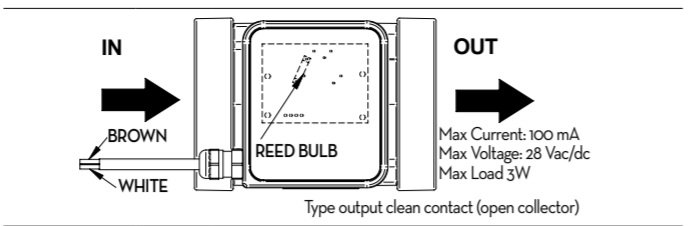
4.3 USERS BUTTONS
The METER features two buttons (RESET and CAL) which individually perform two main functions:
- the RESET key, resetting the partial register and Reset Total
- the CAL key, entering instrument calibration mode

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

INSTALLATION
Avant-propos
K600 METER or PULSER features a 1 inch or 3/4 inch inlet and outlet, depending on the fluid for which they are trained, threaded and perpendicular. It is designed for fixed-in-line installation.

ATTENTION
Make sure the threaded connections do not interfere with the inside of the measuring chamber causing the gears to seize.
Do not use any conical connections which may damage the meter body or the connection flange.
Only the Pulser version must be connected by means of 2 cables according to the electrical features in the diagram.
Carry out installation by placing the suction filter.

ENGLISH (Translated from Italian)



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 K600. Occasionally the meter may need to be configured or calibrated. To do so please refer to the manual which may be requested.
PULSER VERSION The pulser version of K600/3 meter when properly connected to the pulse receiver, does not need any start/stop operation.
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 a factory set and cannot be changed.

The Partial register
Positioned in the top part of the display indicates the quantity dispensed since the RESET key was last pressed
The RESET Total register
Positioned in the lower part of the display, indicates the quantity dispensed since the last RESET Total register. The RESET Total cannot be reset until the Partial has been reset, vice versa, the Partial can always be reset without resetting the RESET Total.
The General TOTAL register (Total)
The register of the two totals (Reset Total and Total)
The General Total (Total)
The Reset Total is shown:

NOTE
6 digits are available for Totals, plus two icons x10 / x100. The flow rate is displayed as follows:
0.0 - 99999.9 - 999999.9 - 100000 x10 - 999999 x10 - 100000 x100 - 999999 x100

6.1 DISPENSING IN NORMAL MODE
Normal mode is the standard dispensing. While the count is made, the partial and resettable total are also counted at the same time (reset total).
This situation is called standby and remains stable until the user operates the K600 again.

6.1.1 PARTIAL RESET (NORMAL MODE)
The partial register can be reset by pressing the reset key when the meter is in standby, meaning when the display screen shows the word "TOTAL".
After pressing the reset key, during reset, the display screen first of all shows all the 16 up digits and then all the digits that are not up.

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 this reset total as on the following display page.

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

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 illustration
then quickly press RESET

6.2.2 RESETTING THE RESET TOTAL
In Field Calibration, performed by means of a dispensing operation:
1 - Direct Calibration, performed by directly changing the calibration factor
2 - Display the currently used calibration factor
3 - Return to factory calibration (Factory K Factor) after a previous calibration by the user
4 - Change the calibration factor using one of the two previously indicated procedures.

6.2.3 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 \* (100 - %E) / 100

6.2.4 MECHANICAL MALFUNCTIONS
Reduced or zero flow rate
The meter does not count, but the flow rate is correct
If the meter does not count, but the flow rate is correct

6.2.5 HIGH LOSS OF HEAD
Dirty filter
Broken gears
Wrong gear installation
Faulty bulb

6.2.6 METER CONFIGURATION
The METER features a menu with which the user can select the main measurement unit, Quarts (Qt), Pints (Pt), Litres (L), Gallons (Gal). The combination of the unit of measurement of the Partial register and that of the Totals is predefined according to the following table:
1 - Wait for the METER to go to Standby
2 - Then press the CAL and RESET keys together. Keep these pressed until the word "UNIT" appears on the screen together with the unit of measurement set at that time (in this example Litres / Liter).

6.2.7 MALFUNCTIONS
LCD: no indications
Not enough measurement precision
The meter does not count, but the flow rate is correct
Mechanical malfunctions
High loss of head
Does not count

6.2.8 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, of:
- Biodegradable cardboard which can be delivered to companies for normal recycling of cellulose.
Metal parts, whether point-finished or in stainless steel, can be consigned to metal collectors.

6.2.9 TECHNICAL SPECIFICATIONS
Resolution
Flow rate range
Operating pressure
Bursting pressure
Measurement system
Storage temperature
Degree of impermeability
Storage humidity
Operating temperature (Max)
Loss of Head at maximum flow rate
Compatible Fluids
Viscosity Range
Accuracy (within capacity range)
Repeatability
Weight
Input and Output Connection Thread
Batteries
Battery Life (expected)

ENGLISH (Translated from Italian)

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 illustration
then quickly press RESET

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

DEFINITIONS

7.1 DEFINITIONS
Calibration factor or "K Factor"
This is the multiplication factor applied by the system to the electrical pulses received, to transform these into measured fluid units
Factory-set default factor: It is equal to 1.000.
This calibration factor ensures utmost precision in the following operating conditions:

Version for diesel fuel
Fluid Temperature : 38°C
Flow rate : 10-100 litres/min
Version for oil
Fluid Temperature : 20°C
Flow rate : 2-60 litres/min

7.2 CALIBRATION MODE
Why calibrate
K600 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)

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.

7.2.2 IN FIELD CALIBRATION
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.

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 \* (100 - %E) / 100

7.2.4 MECHANICAL MALFUNCTIONS
Reduced or zero flow rate
The meter does not count, but the flow rate is correct
If the meter does not count, but the flow rate is correct

7.2.5 HIGH LOSS OF HEAD
Dirty filter
Broken gears
Wrong gear installation
Faulty bulb

7.2.6 METER CONFIGURATION
The METER features a menu with which the user can select the main measurement unit, Quarts (Qt), Pints (Pt), Litres (L), Gallons (Gal). The combination of the unit of measurement of the Partial register and that of the Totals is predefined according to the following table:
1 - Wait for the METER to go to Standby
2 - Then press the CAL and RESET keys together. Keep these pressed until the word "UNIT" appears on the screen together with the unit of measurement set at that time (in this example Litres / Liter).

7.2.7 MALFUNCTIONS
LCD: no indications
Not enough measurement precision
The meter does not count, but the flow rate is correct
Mechanical malfunctions
High loss of head
Does not count

ENGLISH (Translated from Italian)

IN-FIELD CALIBRATION PROCEDURE

1 NONE Meter in Standby
2 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

3 DISPENSING INTO SAMPLE CONTAINER Without pressing any key start dispensing until the sample container is full

4 SHORT RESET key keying The Meter is informed that the calibration procedure is finished. Make sure dispensing is correctly finished before performing this operation. To calibrate the Meter, the value indicated 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.

5 SHORT LONG CAL key keying The indicated value changes in the direction indicated by the arrow - one unit for every short CAL key keying - continuously 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).

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

7 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

8 NO OPERATION The Meter stores the new user 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
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

7.2.4 MECHANICAL MALFUNCTIONS
Reduced or zero flow rate
The meter does not count, but the flow rate is correct
If the meter does not count, but the flow rate is correct

7.2.5 HIGH LOSS OF HEAD
Dirty filter
Broken gears
Wrong gear installation
Faulty bulb

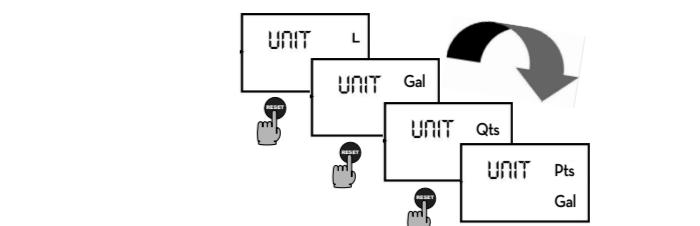
7.2.6 METER CONFIGURATION
The METER features a menu with which the user can select the main measurement unit, Quarts (Qt), Pints (Pt), Litres (L), Gallons (Gal). The combination of the unit of measurement of the Partial register and that of the Totals is predefined according to the following table:
1 - Wait for the METER to go to Standby
2 - Then press the CAL and RESET keys together. Keep these pressed until the word "UNIT" appears on the screen together with the unit of measurement set at that time (in this example Litres / Liter).

7.2.7 MALFUNCTIONS
LCD: no indications
Not enough measurement precision
The meter does not count, but the flow rate is correct
Mechanical malfunctions
High loss of head
Does not count

7.2.8 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, of:
- Biodegradable cardboard which can be delivered to companies for normal recycling of cellulose.
Metal parts, whether point-finished or in stainless steel, can be consigned to metal collectors.

7.2.9 TECHNICAL SPECIFICATIONS
Resolution
Flow rate range
Operating pressure
Bursting pressure
Measurement system
Storage temperature
Degree of impermeability
Storage humidity
Operating temperature (Max)
Loss of Head at maximum flow rate
Compatible Fluids
Viscosity Range
Accuracy (within capacity range)
Repeatability
Weight
Input and Output Connection Thread
Batteries
Battery Life (expected)

ENGLISH (Translated from Italian)



ATTENTION The Reset Total and Total registers will be automatically changed to the new unit of measurement. NO new calibration is required after changing the Unit of Measurement.

9 MAINTENANCE CHANGE BATTERY
FOREWORD The METER has been designed to require a minimum amount of maintenance. The only maintenance jobs required are:
- Battery change - necessary when the batteries have run down
- Cleaning the measurement chamber. This may be necessary due to the particular nature of the dispensed fluids or due to the presence of solid particles following back filtering.
The METER is equipped with 2 x 15 V alkaline batteries (SIZE N).

BATTERY REPLACEMENT WARNING
K600 should be installed in a position allowing the BATTERIES to be replaced without removing it from the system.

K600 features two low-battery alarm levels:
1 When the battery charge falls below the first level on the LCD, the fixed battery symbol appears. In this condition, K600 continues to operate correctly, but the fixed icon warns the user that it is ADVISABLE to change the batteries.
2 If K600 operation continues without changing the batteries, the second battery alarm level will be reached which will prevent operation. In this condition the battery icon starts to flash and is the only one to remain visible on the LCD.

To change the batteries, with reference to the exploded diagram positions, proceed as follows:
1 - Press RESET to update all the totals
2 - Unreset the battery cap (pos.8)
3 - Remove the old batteries
4 - Place the new batteries in the same position as the old ones, making sure the positive pole is positioned as indicated on the cover (pos. 9). Re-tighten the battery cap, making sure the seal (pos.1) are correctly positioned.
5 - The METER will switch on automatically and normal operation can be resumed.

The METER will display the same Result Total, the same Total and the same Partial indicated before the batteries were changed. After changing the batteries, the meter does not need calibrating again.

ATTENTION Do not discard the old batteries in the environment. Refer to local disposal regulations.

9.2 CLEANING
CLEANING THE MEASURING CHAMBER
The K600 measuring chamber can be cleaned without removing the instrument from the line on which it is fitted. Make sure the gears are turning freely before cleaning the cover.
Always make sure that the liquid has drained from the meter before cleaning.

To clean the chamber, proceed as follows (with reference to the exploded diagram positions):
1 - Loosen the four retention screws of the lower cover (pos. 7)
2 - Remove the cover (pos. 7) and the seal (pos. 6)
3 - Remove the oval gears.
4 - Clean where necessary. For this operation, use a brush or pointed object such as a small screwdriver.
Be careful not to damage the body or the gears.
5 - Reassemble the instrument, perform the operations in the opposite sequence.

Perform the assembly diagram to reassemble the gears.
Only one of the two gears, modularly coupled as shown in the picture aside, features magnets. Observe the position of the gear with magnets, as shown in the figure. Fit the second gear (without magnets) with axis greater than 90° compared to the first gear.

The filter-cleaning interval is to be defined depending on the impurities contained in the fluid. To perform this operation, remove the device from the line on which it is installed, as the filter is placed between the meter body and tube connection flange.

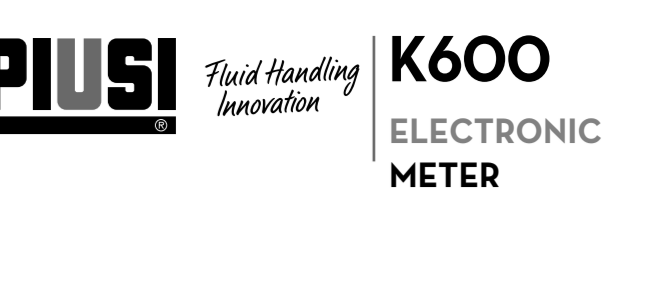
Always make sure that the liquid has drained from the meter before cleaning.
To clean the filter, proceed as follows (with reference to the exploded diagram positions):
1 - To access the filtering disk of the K600/3, loosen the 2 fixing screws of the connection flange at the inlet. Remove both flanges if it is necessary for the system
2 - Remove the meter from the line, being careful to remove also the gaskets between the flanges and threaded connections of K600.
3 - Slide out the filter (pos. 9)
4 - Clean the filter with compressed air.
5 - Carry out the reverse procedure to reassemble the filter.

10 MALFUNCTIONS
ELECTRONIC MALFUNCTIONS
LCD: no indications
Not enough measurement precision
The meter does not count, but the flow rate is correct
Mechanical malfunctions
High loss of head
Does not count

11 DEMOLITION AND DISPOSAL
Foreword
If the system needs to be disposed, the parts which make it up must be delivered to companies that specialize in the recycling and disposal of industrial waste and, in particular, of:
- Biodegradable cardboard which can be delivered to companies for normal recycling of cellulose.
Metal parts, whether point-finished or in stainless steel, can be consigned to metal collectors.

Disposal of electrical and electronic components
European Directive 2012/19/EU requires that all equipment marked with this symbol on the product and/or packaging not be disposed of together with non-differentiated urban waste. The symbol indicates that this product must not be disposed of together with normal household waste. It is the responsibility of the owner to dispose of these products as well as other electric or electronic equipment by means of the specific refuse collection structures indicated by the RAEE or the local government authorities.
Disposing of RAEE equipment as household wastes is strictly forbidden. Such wastes must be disposed of separately.
Any hazardous substances in the electrical and electronic appliances and/or the misuse of such appliances can have potentially serious consequences for the environment and human health.
In case of the unlawful disposal of said wastes, fines will be applicable as defined by the laws in force.
Other components, such as pipes, rubber gaskets, plastic parts and wires, must be disposed of by companies specializing in the disposal of industrial waste.

12 TECHNICAL SPECIFICATIONS
Resolution
Flow rate range
Operating pressure
Bursting pressure
Measurement system
Storage temperature
Degree of impermeability
Storage humidity
Operating temperature (Max)
Loss of Head at maximum flow rate
Compatible Fluids
Viscosity Range
Accuracy (within capacity range)
Repeatability
Weight
Input and Output Connection Thread
Batteries
Battery Life (expected)



Instruction for use, maintenance and calibration
Gebruiksaanwijzing, Wartung und Kalibrierung
BULLETIN M0147 D ENDE\_00

MADE IN ITALY
PIUSI S.p.A. - BREVETTO N° 151415
piusi.com

PIUSI Fluid Handling Innovation

Disposal of electrical and electronic components
European Directive 2012/19/EU requires that all equipment marked with this symbol on the product and/or packaging not be disposed of together with non-differentiated urban waste. The symbol indicates that this product must not be disposed of together with normal household waste. It is the responsibility of the owner to dispose of these products as well as other electric or electronic equipment by means of the specific refuse collection structures indicated by the RAEE or the local government authorities.

Disposal of electrical and electronic components
European Directive 2012/19/EU requires that all equipment marked with this symbol on the product and/or packaging not be disposed of together with non-differentiated urban waste. The symbol indicates that this product must not be disposed of together with normal household waste. It is the responsibility of the owner to dispose of these products as well as other electric or electronic equipment by means of the specific refuse collection structures indicated by the RAEE or the local government authorities.

Disposal of electrical and electronic components
European Directive 2012/19/EU requires that all equipment marked with this symbol on the product and/or packaging not be disposed of together with non-differentiated urban waste. The symbol indicates that this product must not be disposed of together with normal household waste. It is the responsibility of the owner to dispose of these products as well as other electric or electronic equipment by means of the specific refuse collection structures indicated by the RAEE or the local government authorities.

