TW1.4B and TW1.4nA-B
Computing Head
USER GUIDE
Multiproduct version

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1. TECHNICAL DESCRIPTION

The TW1 electronic computing head is designed to operate on multiproduct fuel dispensers with 1 to 4 nozzles. One or two-sided display systems can be used.

It can deliver in both Euro and liter pre-setting, and communicate with Host and, in the same time, it can communicate with Host by giving data about the current delivery, the selected product and the status of the device.

1.1. Structural specifications

The computing head is made up of:

o **Lower board:** it is made up of CPU, power supplier, communication interface and Output devicest.

o **Upper board:** it is made up of a field interface multiplexer both as Input and Output.

Both cards are settled in a metallic box to be protected both mechanically and against EMI jamming.
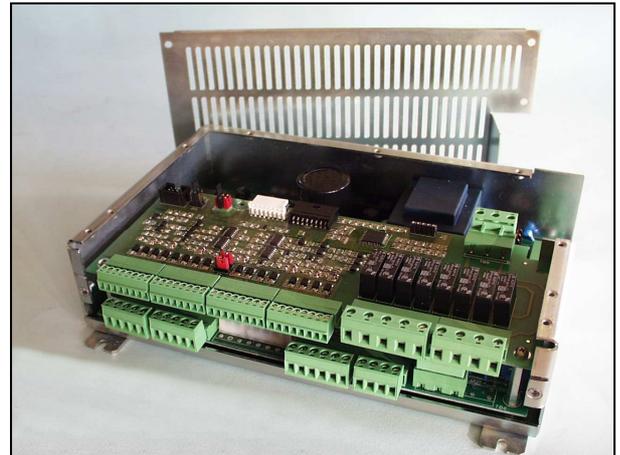
o **Price changing / setup board;** settled in a plastic box. This assembly can be mounted when necessary.

o One or two **display boards**, settled into a metallic box, allow to show on both sides the delivered.

o A **unit price display card** and a **totalizer card** complete the electronic computing head.

Photo 1: CPU
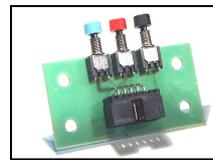
Photo 2: Set-up / Price-change quantity

Photo 3: Display, unity price and Totalizer board

1.2. Technical data

➢ *Power supply:*   230Vac ± 10%
➢ *Absorbed power:*   12VA
➢ *Temperature:*   min. –40°C max. 85°C
➢ *Humidity (without dew):* 95%
➢ *Max flow rate:*   3.5l/s
➢ *Measure:*   liter
➢ *Output control:*   N.O. max 270Vca/3A Standard o /1A Atex **(*)**

(*) Outputs device depending:
    Relays for TW1-M "Standard",
    or Solid State relays for TW1nA-M "ATEX".

- *Pulser; 2 channel:*   1 pulse   = 1cl
- *Non-resetting electromechanical totalizer (7digits):*   1 pulse   = 1litre
- *Non-resetting electronic totalizer (10digits):*   1 pulse   = 1litre
- *Computing Head CPU dimensions:*   (230 x 154 x 66)mm
- *Computing Head CPU Weight:*   2070g
- *Computing Head Display Dimension:*   (225 x 250 x 50)mm
- *Computing Head Display Weight:*   960g
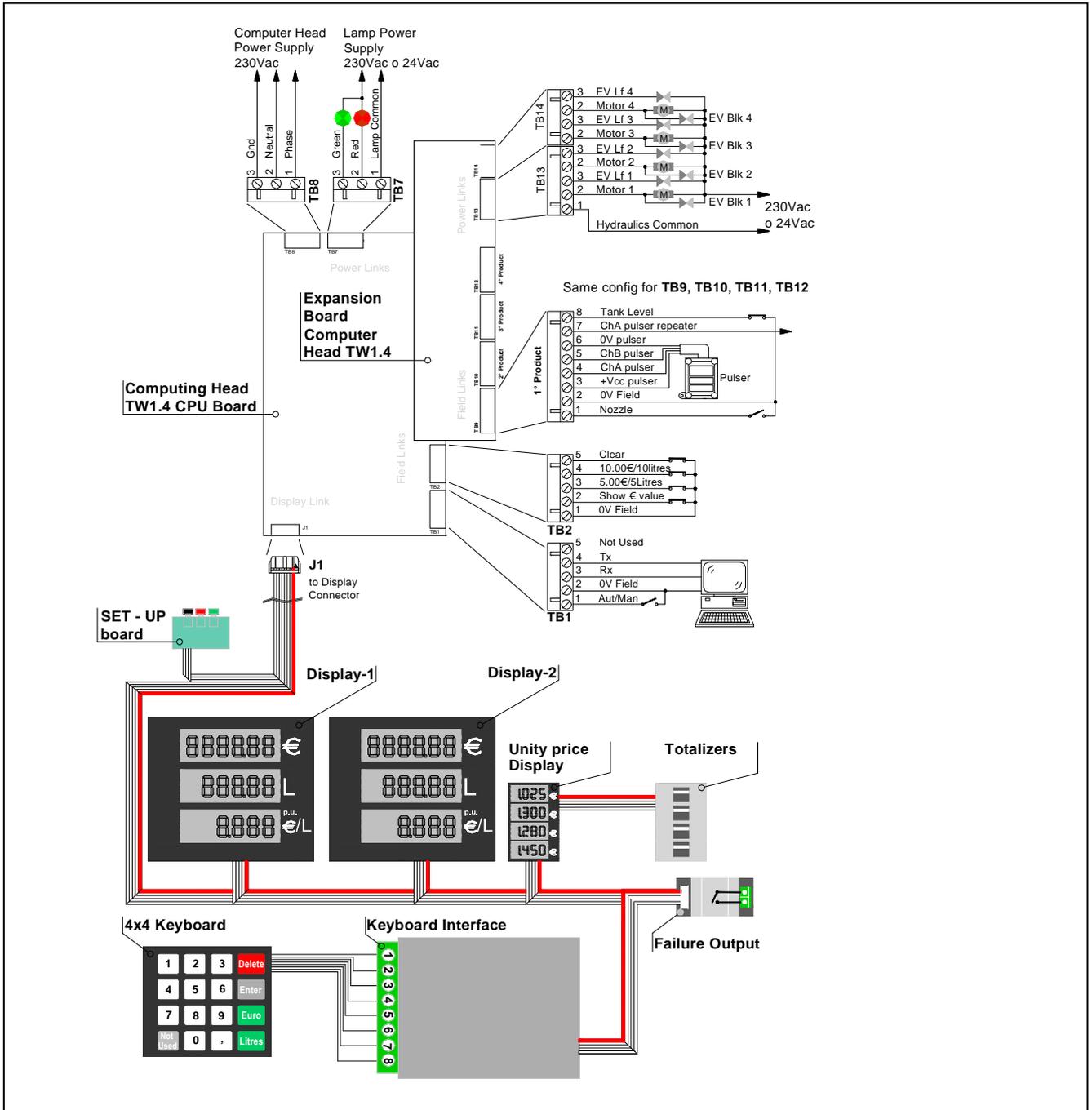
Figure 1: Summary of electric connections

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2. FUNCTIONAL DESCRIPTION

2.1. Data Display

The TW1.4 computing head can be combined with up to four-nozzle multiproduct dispensers. Data is always displayed as follows: 6-digit display for the amount, 5-digit display for the fuel delivered 4-digit display for unit price.

Display bars are made by 25,4mm high LCDs with backlighting. Backlighting system is made of a PCB carrying a led matrix; it is mounted on the backside of the metallic box and spreads a flooded green light. It is also possibile to use a system wit a neon tube or the lighting of the dispenser itself.

888888 €	AMOUNT
88888 L	Q.TY DELIVERED
8.888 €/L	UNIT PRICE

Product 1 price	1025 €
Product 2 price	1300 €
Product 3 price	1280 €
Product 4 price	1450 €
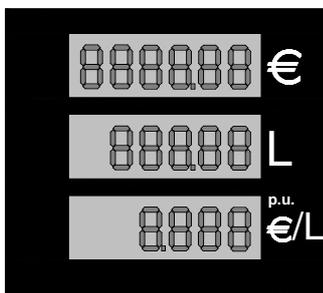
Figure 2: Maximum visualization   **Figure 3:** Unit price data display

There is also a second display which always shows the unit price of each product. The unit price display is made by 12,7mm high LCD and is backlighted by a green led matrix.

2.2. Operating sequences description

When switched on, the computing head performs some checks:

➢ EPROM   -   it checks the EPROM CRC and compares it to the data reported on the program.
➢ RAM   -   it checks the writing and reading ability of the data RAM.
➢ EEROM   -   it checks the consistency of the data reported in EEROM.
➢ DISPLAY   -   it checks the connection status of the display(s).
➢ RX – TX   -   presence of active connection to Host
➢ DATA CONSISTENCY -   consistency of the data in RAM con quelli originali in EEROM

If the above mentioned checks give a positive result, just before switching off display shows for a while the program code, then data regarding the last delivery. In case of anomalies, display shows, if possible, the corresponding error code (See "Troubleshooting" §3).

With nozzle in place the computing head performs the following checks:

➢ The same as explained above.
➢ TANK LEVELS   -   It checks the levels of the tanks connected to each nozzle.

Delivery begins when one of the four available nozzles is extracted:

If dispenser is available, when one of the four nozzles is extracted, before starting a speed running delivery the computing head performs the following tests:

➢ The same as explained above
➢ Display - All digits show 8, than Blank and finally 0.00 Euro and 0.00 litres. Each phase takes about one second: this way operator can check at a glance the correct working of each digit.
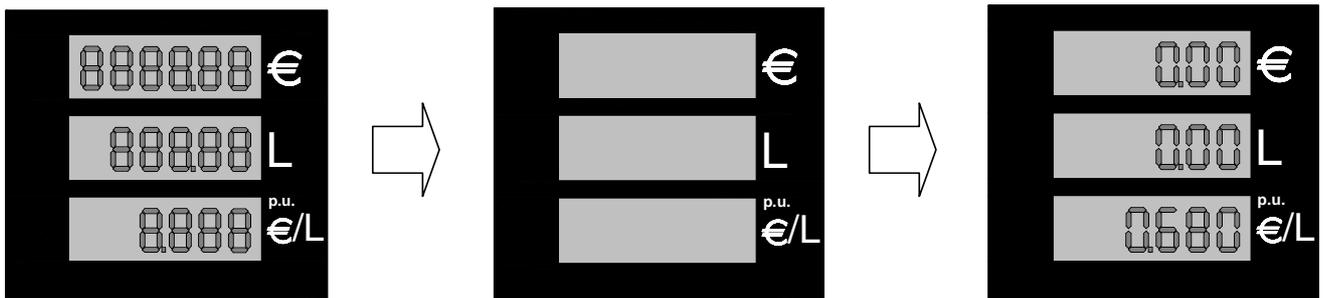
Figure 4: Beginning delivery sequence – Gasoline contometric version

➢ Anti-fuel jet device – To check that pipe and the whole selected line are unimpaired, during the display test motor starts and checks that the quantity delivered in this phase (AS), does not exceed the quantity programmed (some cl due to pipe bulking can be accepted). If the quantity delivered exceeds the programmed one, the computing head stops the delivery. (operator can program this function in set-up)

After this phase the computing head starts a speed running delivery.

During the delivery the computing head performs the following functions:

➢ Activation of relays: motor, solenoid-valves, signal-light.
Acquisition of pulses coming from the transducer of the product selected: 1 pulse = 1cl.
➢ Calculation and display of the quantity delivered and related amount.
➢ Check consistency of the data displayed (implicit with RAM and EPROM control).
➢ Functional check of the display(s).
➢ Check and management of electronic and electromechanical totalizers.
➢ Check of the power supply on motor line (see § 3.).

Delivery ends because of:

➢ Nozzle back in place
➢ Pre-set value has been reached.
➢ Max. amount or max. quantity delivered has been reached.
➢ Anomaly (see §3).
➢ Pulser unoperating longer than the time selected during set-up (SE parameter)
➢ Block command coming from Host.

…If delivery stops because of an anomaly:
display shows, if possible, the relevant error code. (see. Troubleshooting §3.).

2.2.1 *Manual delivery*

Operator decides to start / stop the delivery by hanging off / replacing the nozzle.

2.2.2 *Pre-set value delivery*

The computing head provides to stop delivery once the pre-set value is reached, both in case of programming by pre-set buttons and in case of Host programming.

2.2.3 *Pre-setting on dispenser*

Operator can program through buttons the fuel quantity to be delivered as amount (€) as well as volume (ℓ):
To have the pre-set quantity, operator has to push the buttons in sequence. By pushing the CLEAR button, operator can see the previous delivery.

Position	Amount "€"	Quantity Delivered "I"
Button 1	5.00	1.00
Button 2	10.00	10.00
Button 3	CLEAR	CLEAR

The amounts given in this table is just an example and depend on the value given to each button during the set-up phase. The quantities delivered, are fixed and can't be modified.
Required quantity is shown as follows:

- Unit price display   - always active.

- Amount display   - if Euro is selected, display shows the required value otherwise it is off.

- Quantity delivered display - if litres are selected, display shows the pre-set value otherwise it is off.

Figure 5: Example of a 5.00€ Amount pre-setting
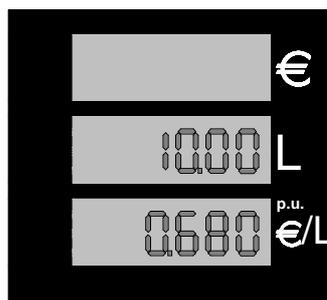
Figure 6: Example of a 10l delivered quantity pre- setting

2.2.4 *Pre-setting by Host*

Each time the computing head is connected to a Host, with a Pre-pay as well as Post-pay function, it can receive pre-set values indifferently in Euros or litres, as long as POS has this function.

> **No metric parameter can be changed by Host**
> **Unit price can't be modified during**

2.2.5 *Pre-setting by 16 key keyboard*

When computing head switches on, it makes a keyboard presence control. If this test is positive, the computing head manages the keyboard to pre-set a quantity or an amount to be delivered.

Figure 7: *16-key keyboard*

With nozzles in place, keyboard works and can be used as follows:

1. Choose Euro or Liter pre-set by pressing the corresponding button.
2. Press number buttons (with comma, if necessary) to pre-set value.
3. Press « ENTER ». Now the display of the computing head shows on the LCD the amount (upper line) or the quantity delivered (central line)..
4. If the value is correct, delivery can start. If an error occurs, press « DELETE » and repeat steps 1÷3.

During the delivery, keyboard doesn't work.
When operator puts the nozzle back in place another operation is possible.

2.2.6 *Automatic stop sequence*

Automatic stop occurs in two phases:
➤ Flow rate reduction by controlling a solenoid valve. The point of intervention can be varied by set-up (LF parameter) following the procedure described below.
➤ Motor and solenoid valve stop.

2.2.7 *Stop at round number*

During the delivery operator can ask the computing head to stop the current delivery at the next round number:

with nozzle in place and the motor operating, push one of the two pre-set buttons, and re-start the delivery by extracting the nozzle: this way the computing head will stop at the next Euro or litre (see §2.2.5)

2.2.8 *Network interruption management*

If during normal operations a power shortage or even a blackout should occur, both when nozzle is in place and during delivery, the computing head enters a procedure called PWF which allows to memorize: amount, quantity distributed and totalizer.
The data is displayed for about 30 minutes from the moment the network shortage occurred. The no-network status is shown by writing OFF on the unit price bar. When power supply is restored, data related to interrupted distribution is read by the memory and shown on the display.

2.3. Connection to Host

The computing head has a 3-wire connection: TX, RX, Gnd. To obtain other kind of connection it is possible to add an adapter card. To use or increase different protocols a licence by the owner is necessary.

2.4. Euro

By its set up, the computing head can work with different foreign currencies: it is possible to set the number of decimals for unit price and for amount. In any case operator can choose quickly the Euro set by setting jumper J3: while starting, the computer head will set the correct decimal digits

Further, as requested from the standard, in those countries, which are approaching to the Euro, after the refuelling process shown in local currency, it's possible to visualize the amount converted in Euro by temporarily pushing an appropriate button. The standard rate DGII-C-4(99) is used as conversion factor. By pushing the button for a second time, the display will switch back to the local currency value. If another refuelling process should be started, the computing head switches in any case to the normal visualization.
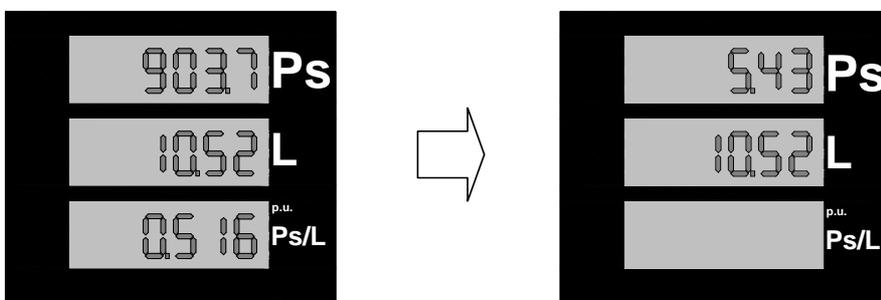
Figure 8: Temporary amount conversion from Pesetas to Euro

3. TROUBLESHOOTING

During its normal functioning, the computing head controls the internal data flow and the congruence of data coming from outside. Possible anomalies are handled in different ways according to the damage they may cause to data. The computing head can find both *Fatal* and *Non Fatal Errors*. However, it stops the current delivery and displays the memorized error code and, if connected to Host, give the error status.

3.1. Fatal errors

Fatal errors are normally due to malfunctioning, which may cause data loss. In such case the computing head stops the delivery, displays the corresponding code and does not restart. To start again it must be reset by switching off power supply.

- ➢ Data consistency
- ➢ EPROM Error
- ➢ RAM Data consistency
- ➢ EEROM Error

- ➢ Totalizer presence error
- ➢ Pulser presence error
- ➢ Thermal intervention

3.2. Non fatal error

Belong to this category all blocks due to an anomalous status of the field and those related to a temporary operating anomaly, caused by a secondary situation such as the lack of unit price, or by an occasional situation, for example because of an incorrect data due to a disturbance. In this case, the error will be automatically deleted as soon as the anomalous status that created it ends .

The computing head makes 3 attempts to restart; at the fourth unsuccessful attempt, the error turns into fatal.

- ➢ Display
- ➢ Communication to Host
- ➢ Set-up data loss

- ➢ Tank level
- ➢ Pulser chanel control
- ➢ Anti-fuel jet device

3.3. Error Review Table

ERROR REVIEW TABLE					
Non fatal errors			**Fatal errors**		
Code	**Display**	**Description**	**Code**	**Display**	**Description**
E70	Erd1	Display 1	F15	FECd	Data congruence
E70	Erd2	Display 2	F11	FEEP	Eprom
E70	Erd3	Unit Price A Display	F10	FErA	Ram
E80	ErLn	Communication	F15	FEEE	Eerom
E41	ErSU	Data setup loss	F70	Fto1,2,3,4	Totalizer
E41	ELC1,2,3,4	Tank level	F42	FPP1,2,3,4	Pulser presence
E71	ErP1,2,3,4	Channel turn-over pulser	F44	FHt1,2,3,4	Thermal intervention
E77	ErAS	Anti fuel-jet device	F44	FERV	Vapor Recovery

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Description of anomalies:

➢ Display

The computing head controls the presence of the single LCD bars, and identifies the missing line.

Error code: **Erd1, 2, 3**

➢ Communication to Host

The computing head controls that there is a "polling" call from Host at least every 5s. If there is no call delivery will be blocked.

Error code: **ErLn**

➢ Set-up data missing

If set-up data is missing or not congruent, the computing head does not deliver and operator is obliged to input data.

Error code: **ErSU**

➢ Tank level

The computing head controls the level sensor: it can stop the current delivery as well as wait for the end of the delivery. In both cases the next delivery is not possible (note1)

Error code: **ELC1, 2, 3, 4**

➢ Pulser channel control

The computing head checks the Encoder alternating output channels, in case it's negative distribution stops.

Error code: **ErP1, 2, 3, 4**

➢ Anti fuel-jet device

At the beginning of every delivery, the computing head checks that there is no lack in the hydraulic circuit. If there are lacks, it stops the delivery.

Error code: **ErAS**

➢ Data consistency

Data consistency verification. The computing head checks continuously, even during delivery, all data saved in RAM, in case of error it blocks delivery.

Error code: **FECd**

➢ EPROM Error

With nozzle in place the computing head checks the Eprom checksum; if the check has negative result distribution stops.

Error code: **FEEP**

➢ RAM Error

With nozzle in place, the computing head checks the RAM, in case it's negative distribution stops.

Error code: **FErA**

➢ EEROM Error

With nozzle in place, the computing head checks the E²rom, in case it's negative distribution stops.

Error code: **FEEE**

➢ Totalizer Error

The computing head checks for totalizer(s) presence. In case an error occurs, the distribution stops..

Error code: **Fto1,2,3,4**

➢ Pulser Presence Error

The computing head checks for Encoder(s) presence, in case it's missing distribution stops.

Error code: **FEP1, 2, 3, 4**

➢ Thermal intervention

During the delivery, the computing head controls that there is no thermal intervention. In case an error occurs, it finally stops the delivery.

Error code: **FHt1, 2, 3, 4**

➢ Vapor Recovery

Errore che interviene quando la pompa di recupero vapore assorbe una anche minima quantità di liquido

Dichiarazione di guasto: **FErV**

NOTE

Tank level is a multifunction input: by setting properly the corresponding parameters operator can use it both to gather a level sensor and to stop the delivery when the fume recovery system fails. (see Computing Head Set-up §4.2).

4. PROCEDURES

In addition to normal delivery three more procedures are available:
- absolute **totaliser** reading
- computing head **set-up** (changing of configuration parameters), price change
- Metric office (simulation of anomalies)

To start a procedure, operator has to press one of the buttons on the set-up card and display shows the following notice:
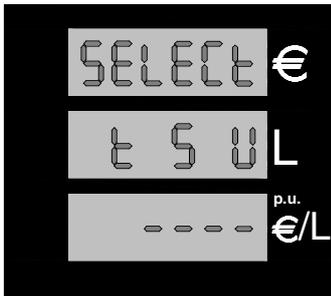

Figure 9: Display "waiting for procedure selection"

By pressing one of the set-up buttons the relevant procedure is activted push-buttons are available on the printed circuit connected to the same cable of the display.
The position of buttons is the same as shown by display t – S – U (see figures 9 and 10):

Procedure   black «t»   absolute **totaliser** reading

Procedure   red «S»   computing head **set-up**: parameter change, price change

Procedure   green «U»   **Metric office:** anomaly simulation
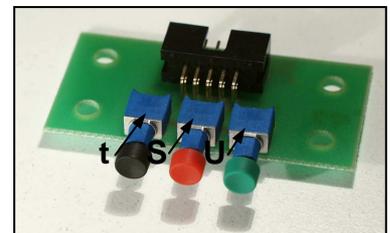
Figure 10: set-up allotting

4.1. Absolute totaliser reading

An absolute totaliser is combined to each product. Absolute is a counter which cannot be reset and allows to store and display the quantity delivered in litres on 10 digits. Since it is not possible to dispose of such an extended display, digits are subdivided into groups and visualised as follows:

1° group 1 digit	2° group 3 digits	3° group 3 digits	4° group 3 digits
0	000	000	00**0**

Most significant digit   least significant digit

0.000.000.00**0**
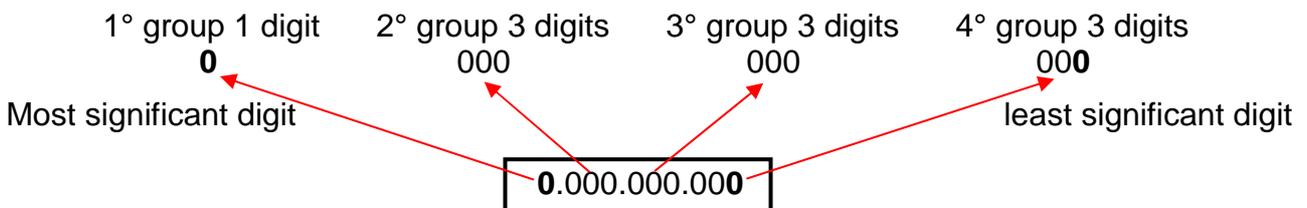
 After pressing black button «t» the computing head displays the first group, in order to pass to the second and to the third, it is necessary to push the «U» green button.

Figure 11: Liter absolute totaliser display for product 1

By pressing again green push- button «U» operator can see the same series referred to product 2 (and so on for product 3 and 4).
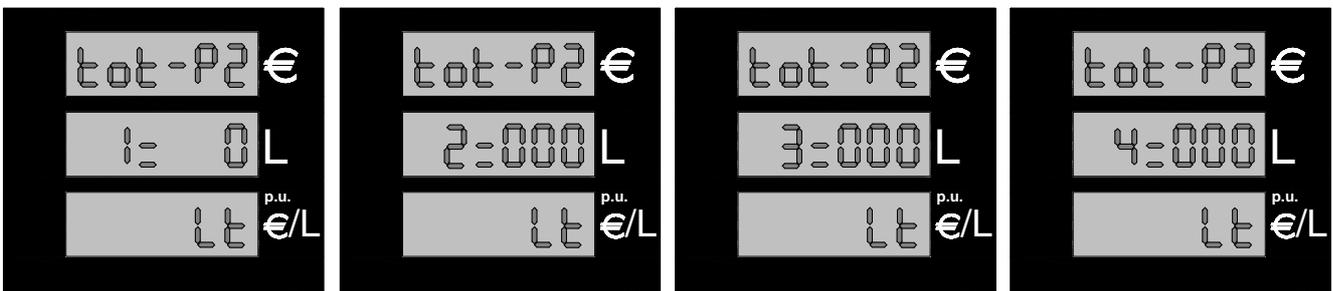
Figure 12: Liter absolute totaliser display for product 2

Moreover, four electro-mechanical totalisers, mounted on the card, are available: they cannot be reset and can visualise up to 7 digits. These totalisers are controlled and, in case of malfunctioning, the computing head stops the current delivery and displays the error code: Fto1, 2, 3, 4
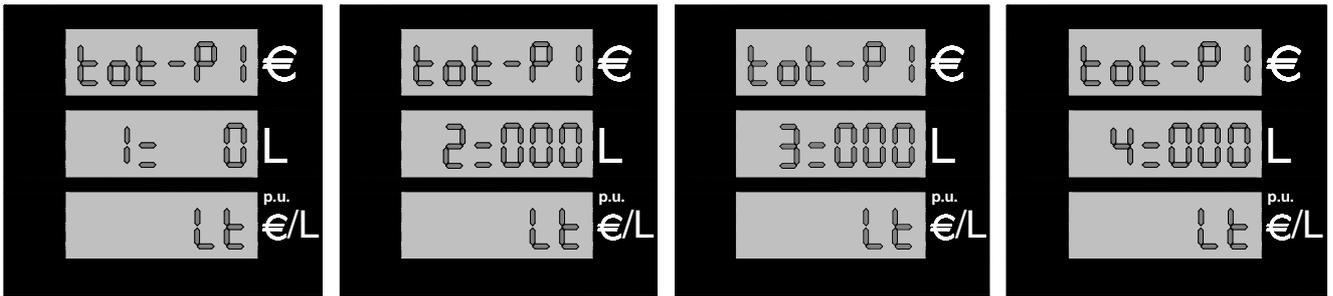
4.2. Computing head set-up
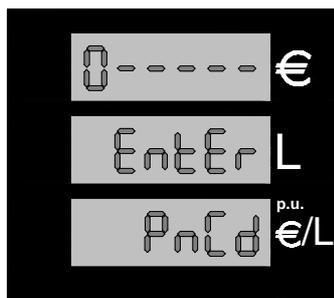
After pressing the red key «S» and entering the set-up mode, the computing head requires the default password "20000".

> **To enter the SETUP procedure, operator has to set JP2 Jumper "closed".**
> **SETUP can't be done if JP2 Jumper is "open".**

To enter the correct code, operator has to follow this procedure:

Figure 13: enter password

- Set J2 Jumper
- Press black button «t» until the required value for the first digit is reached
- Press red button «S» to go to next digit
- When the correct value is reached also for last digit, press again red button «S» to enter set-up.

If password is not correct, set-up procedure stops and computing head enters stand-by. If password is correct, parameter values can be up-dated.

The following table shows all the available parameters:

Code	Abbr.	Meaning	Field	Increasing n°	Measure
		Computing head set-up parameters			
01,2,3,4	C1,2,3,4	Fuel code Nozzle 1,2,3,4	0-9	1	----
05,6,7,8	L1,2,3,4	Low flow rate Nozzle,2,3,4	10-90	10	cl
09	AS	Anti fuel jet device	0-90	3	cl
10	AL	LAN address	1-32	1	----
11	Pr	Pre-set type	0-2	1	----
12	EL	First delivered cl clearance	0-10	1	cl
13	AP	Number of cl in b. p. delivery start	0-10	1	cl
14	PC	Min level contact polarity	0-1	1	----
15	BC	Block mode for min. level	0-1	1	----
16	Ar	Amount approximation	0-3	1	----
17	DP	Decimals in unit price	0-3	1	----
18	DI	Decimals in amount	0-3	1	----
19	Ct	Passage to round number	1-3	1	----
20	LC	Tank level / Fume recovery	0-1	1	----
21	Pt	Electromechanical totalzer presence	0-1	1	----
22	Nd	Number of main displays	1-2	1	----
23	Np	Number of unit price displays	0-2	1	----
24	SE	Wait-up before delivery block	1-5	1	10s
25	Po	Pos option	0-1	1	----
26	Sd	Start delay	0-3	1	----
27	CF	Currency/€ Conversion rate	0-9/dig	1/dig	----
28	Pulse1 Adj	Pulse "weight" change Nozzle1	0- ±20‰	1/dig	----
29	Pulse1 Adj	Pulse "weight" change Nozzle2	0- ±20‰	1/dig	----
30	Pulse1 Adj	Pulse "weight" change Nozzle3	0- ±20‰	1/dig	----
31	Pulse1 Adj	Pulse "weight" change Nozzle4	0- ±20‰	1/dig	----
32	P1	Pre-set value bush-button 1	0-9/dig	1/dig	€
33	P2	Pre-set value bush-button 2	0-9/dig	1/dig	€
34	PnCd	Password	X0-9999	1	----

Description of set-up parameters:

- ➢ **C1, 2, 3, 4** product code — To each nozzle (hydraulic) must have one product assigned, here is a list of possible codes:

0	nozzle not used	5	product 5
1	product 1	6	product 6
2	product 2	7	product 7
3	product 3	8	product 8
4	product 4	9	product 9

  Operator assigns the kind of product (Sp gasoline, diesel, etc) to the product code through POS.

- ➢ **L1, 2, 3, 4** low flow rate — At the end of a delivery with pre-setting, in order to stop at a round number, it is necessary to deliver at low flow rate. LF indicates how many cl before the end of delivery this phase must start.

- ➢ **AS** anti-fuel jet device — Quantity expressed in cl that computing head can count before starting the delivery.

- ➢ **AL** LAN address — It is the address that computing head takes when it is connected to Host Computer.

- ➢ **Pr** Pre-set type — According to the value of this parameter the computing head can deliver as follows:
  - 0 no pre-set
  - 1 liter pre-set
  - 2 Euro pre-set

- ➢ **EL** cl clearance — It shows how many cl are not displayed at the beginning of each delivery.

- ➢ **AP** low flow rate delivery — It shows how many cl are delivered in low flow rate mode before delivery is completely started.

- ➢ **PC** min. level — It shows if the alarm state for minimum level must be activated with normally closed or open contact.

- ➢ **BC** intervention mode — It shows if the alarm intervention for minimum level has to start at the end of delivery (BC = 0 or it can start during delivery (BC = 1).

- ➢ **Ar** Amount rounding — It specifies the rounding type:
  - 0 no rounding   last digit 0-9
  - 1 if last digit ≥ 5 in excess   last digit 10
    if last digit < 5 in defect   last digit 0
  - 2 if last digit > 0 and ≤ 5 in excess   last digit 5
    if last digit > 5 and ≤ 9 in excess   last digit 10
  - 3 if previous digit ≥ 5 in excess   last digit 10
    if previous digit < 5 in defect   last digit 0

- ➢ **Dp** price decimals — it specifies the number of decimals (decimal point position) on the unit price line.

- ➢ **Di** amount decimals — it specifies the number of digits on the right of the amount comma.

- ➢ **Ct** passage to round number — It specifies the type of passage to a round number:
  - 1 no passage
  - 2 passage to units (1.00, 2.00, ecc.)
  - 3 passage to tens (10.00, 20.00, ecc.)

- ➢ **LC** tank lev/fume recovery — It specifies if the LC input will be used to detect a tank level or to display the fume recovery system.

- ➢ **nd** number of main displays — it indicates the number of connected displays

- ➢ **nP** number of u. price displays — it indicates the number of connected unit price displays.

- ➢ **SE** delivery block wait-up — it indicates, in tens of seconds (from 10 to 50), the maximum time without delivery pulses, after which the motor turns off automatically, delivery ends and nozzle must be set back in place.

- ➢ **Po** Pos option — way to send to POS the quantity delivered:

  0 normal
  1 multiplied by 10

- ➢ **Sd** Start delay — it specifies the start delay:

  - 0 Start in the moment nozzle is extracted
  - 1 Start at the end of blanc display (no AS)
  - 2 Start after visualizing time 0.00 (no AS)

  If delay is ≠ 0 then anti-fuel jet device is inhibited (it is incompatible).

- ➢ **CF** Conversion Rate — It is the conversion rate between the local currency and Euro.

- ➢ **P1** Preset button 1 — By pressing P1 button, operator settles the amount to be delivered.

- ➢ **P2** Preset button 2 — By pressing P2 button, operator settles the amount to be delivered.

- ➢ **PnCd** Password — Operator needs this code to manage the computing head.

4.2.1 *Simple parameters*

- Choose the parameter to be modified (by pressing grreen button «U» operator can change parameter).
- Press black button «t» to increase the current value of the parameter.
- Press red button «S» to set to zero or riduce to the minimum the current value of the parameter.
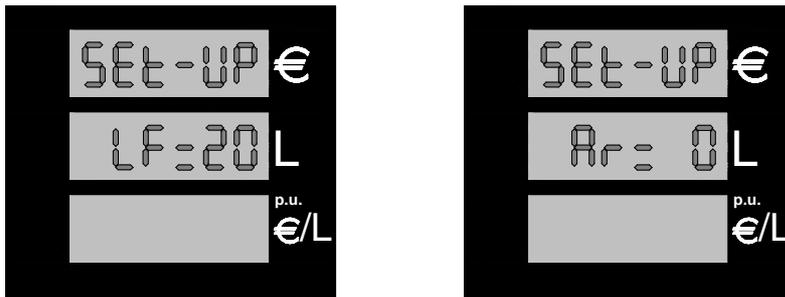- Press green button «U» to go to next parameter.

Figure 14: display of some Set-up parameters

4.2.2 *Complex parameters*

Some parameters have more digits, for this reason to be able to change them, operator has to follow a different procedure and parameter display:

- **CF Parameter** Conversion rate of local currency into Euro has 1 whole number and 5 decimales (e.g. old French Franc is 6.55957).
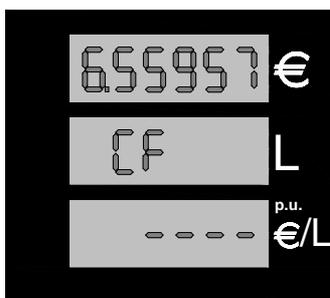 CF values are settled by DGII-C-4(99) rules.

Figure 15: Currency/Euro Conversion rate display parameter

Press black button «t» to increase the blanking digit value, press red button «S» to go to the next digit, press green button «U» to exit the procedure.

- **ADJ Pulse 1..4** this procedure allows operator to calibrate the mechanical measurer by changing the pulse value (nominal value: 1 pulse = 1 cl). This procedure can be set only in those countries where law allows this change. Before entering this procedure operator has to supply a 20 l sure quantity (by using a 20 l certified measure).
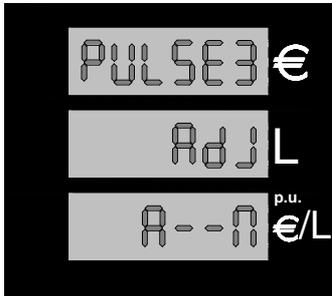
Entering the procedure display shows:

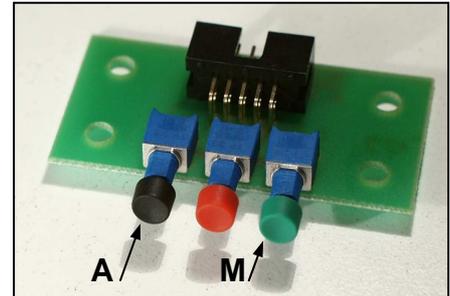**Figure 16:** AdJ Pulse product 1 starting display

Figure 17: Button allotting

Press black button «A» or green button «M» to workin Automatic or Manual adjustement. If operator selects «A», the computing head calculates the difference between the quantity delivered and the real quantity (20liters) and suggests to add or subtract the calculated error given in parts per 1000.
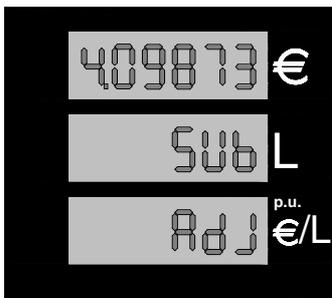

To end the procedure, press again green button.

If operator selects «**M**», the computing head allows to set manually the adjustement value given in parts per 1000.

Figure 18: 4.09873‰ Adjustement value

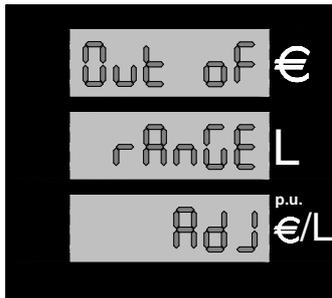- Press black button to obtain the choosen value for the first digit.
- Press red button to go to the next digit.
- Once the last digit is correct too, press green button to confirm.
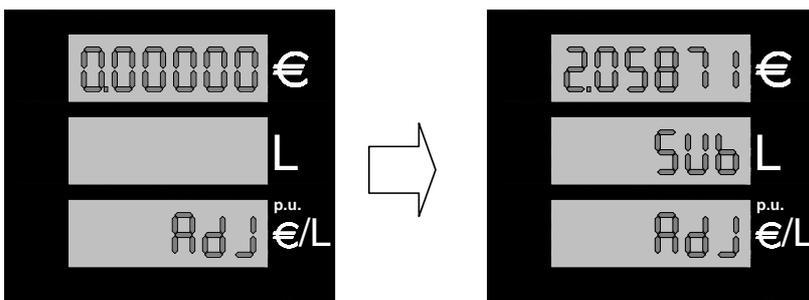
Figure 19: Adjustement value manual set

- Press black button to select the adjustement:

    SUM   to add
    SUB   to subtract
    ===   to set the conversion rate to zero

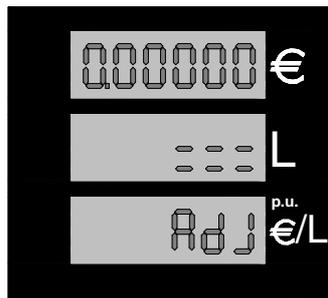- Press green button to end

For next adjustements, in automatic as well as in manual mode, the computing head always considers the supplied value: for this reason operator has not to cancel the previous adjustement value. The maximum accepted adjustement range is ± 9,99999 parts x 1000. If error exceeds the adjustement ability, the computing head shows "out of range" and sets the adjustement value to zero.

Figure 20: Error exceeds the adjustement ability

If error is <1.00000 the computing head sets the adjustement value to zero.
Press green button to end.

Figure 21: Error <1.00000

- **P1** preset value Button 1, this value is accepted only in case of Euro preset, in case of liter preset this value is 1l.
- **P2** preset value Button 2, also this value is accepted only in case of Euro preset, in case of liter preset this value is 10l.
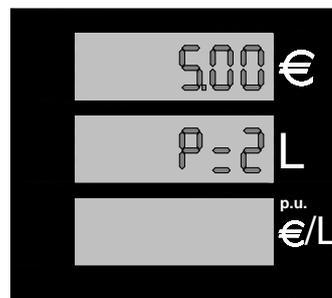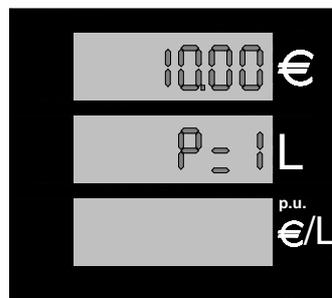
Press black button «t» to increase the value of the blinking digit.
Press the red button «S» to go to to the next digit.
Press green button «U» to exit the procedure.

Figure 22: Example of P1 and P2 value in Euro

- **Password**
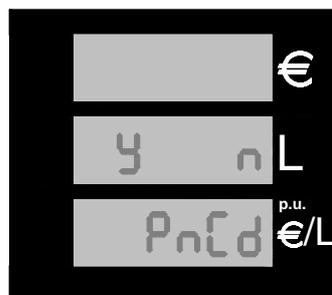
At the end of the set-up the computing head asks whether changing the password or not and waits for an answer (**Y**es or **N**ot)
Press black button to change the password.
Press green button to exit without changing the password.

Figure 23: Password change request

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If operator answers **N**ot, procedure ends after saving data.
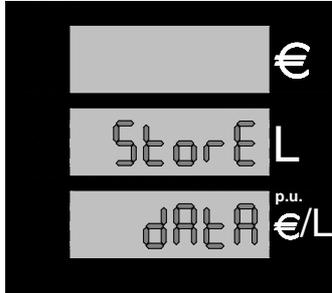If operato answers **Y**es, password can be modified:

- Press black button to have the required value for the first digit.
- Press red button to go to the next digit.
- Once the last digit shows the right value too, press green button to confirm.

Figure 24: Data saving display

Password has the following structure o:

Technician password value :   **2XXXX**
It allows to modify all the parameters of the set-up procedure. The first value is always 2 and shows reserved to the manager plant.
Starting value is 20000

Manager password value: **1XXXX**
It allows to change only prices. The first value is always 1 and shows i reserved to the maintenance company
Starting value is 10000

Importer password value: **3XXXX**
It allows only to set to zero previous passwords
Starting value is wired inside the firmware. It is communicated to the customer at the moment of the sale and it cannot be modified.
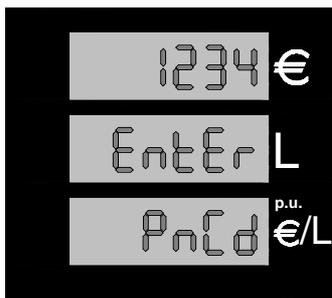
Password is made up of 5 digits. The first digit shows the access level: Importer, maintainer, manager plant. Within the procedure, the first digit cannot be modified (it shows the level access) and it is the same digit used to enter: for this reason it is not displaid; the other four digits are set by the user.

Figure 25: Password change

> *To exit the SETUP procedure, operator has to set JP2 Jumper "open".*
> *Delivery is not possible if JP2 Jumper is "closed" in SETUP.*

4.2.3 *Price change*

After pressing red button «S» and entering set-up, the computing head asks for password: if password has not been changed, "10000" is the default value. To enter the codeoperator has to follow three steps:
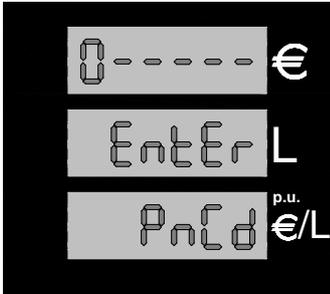

Figure 26: Entering password

- Press black button «t» to obtain the choosen value for the first digit.
- Press red button «S» to go to the next digit.
- After obtaining the right value for the last digit, press again red button «S» to enter set-up.

> *To enter **Price Change Procedure** removing Lead keeping is not necessary to set J2 Jumper, because this action is not important from a metrical point of view.*

If password is wrong, computing head exits set-up and enters stand-by mode.
If password is right, unit price can be changed:

- Press red button   «S»   to select the digit.
- Press black button   «t»   to obtain the right value.
- Press green button   «U»   to exit the procedure.

At the end of set-up At the end of the set-up the computing head asks whether changing the password or not and waits for an answer (**Y**es or **N**ot).

Press black button to change the password.
Press green button to exit without changing the password.

Figure 27: Password change request

Figure 28: Saving Unit Price

If operator answers **N**ot, procedure ends by saving the new unit price.
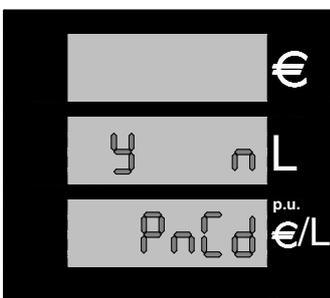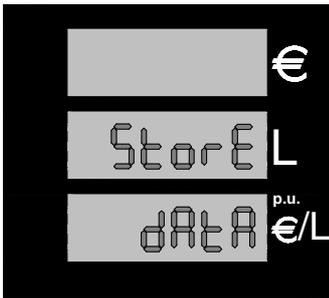
If operator answers **Y**es, password can be changed:
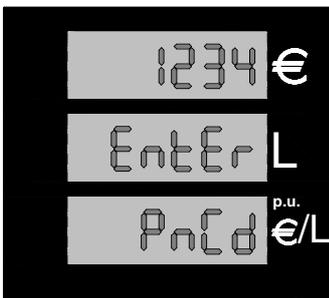
- Press black button to obtain the right value for the first digit.
- Press red button to go to the next digit.
- Once the last digit shows the right value, press the green push- button to confirm.

Figure 29: Entering password

4.3.   Anomaly simulation

This procedure is connected to the Measurement Test and it is splitted into two steps:
- memory of the mechanical measurer correction management
- error simulation

4.3.1   *Meter factor memory*

In addition to the current factor,the computing head can save the last three meter factors: in this way operator can test meter oscillations due to temperature or season changes (for example).
After entering the procedure, the computing head shows the current factor HISt 0, and the last three factors HISt 1, HISt 2, HISt 3, for each product of the four available ones.

Figure 30: The four Meter factors of product 1

Press green button «U» to enter the procedure and keep on pressing it to see the saved values.

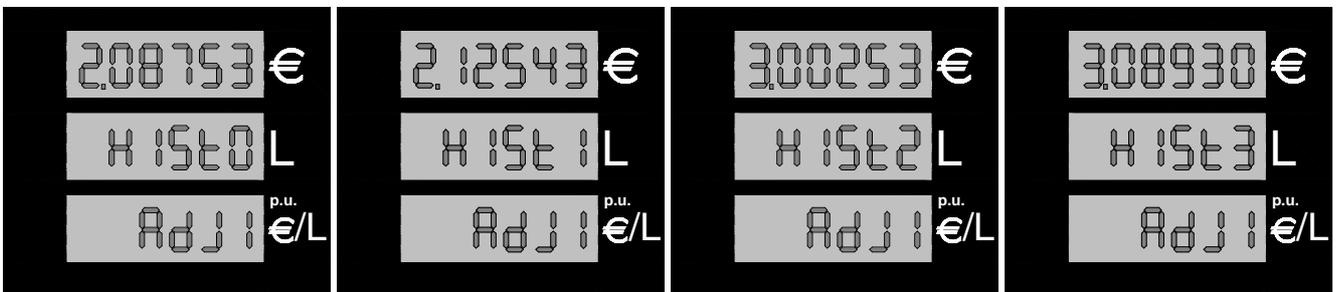After showing the last value, the computing head asks whether starting the anomaly simulation procedure or not: press black button «Y» to enter the procedure, or green button «N» to quit.
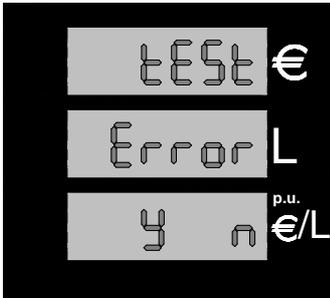
Figure 31: Request for confirmation of the simulation of anomalies procedure

4.3.2 *Simulation of anomalies*

Operator can simulate errors and test that the computing head stops to supply and shows the anomaly code. Simulated errors are listed in list of ERROR CODES (see §1).

To show the current simulation mode, the computing head lights on all the leds on the price bar and and the external leds on the delivered-quantity bar.

After entering the procedure, each time the nozzle is extracted the computing head starts to deliver, simulates an error and, as sooon as the fault is found, it stops the delivery.

The fault code is shown on the unit price bar.
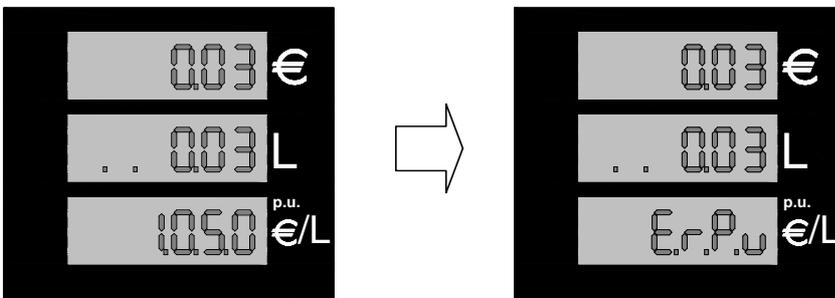
Figure 32: From delivery to stop mode during a phase of "Simulation of anomaly".

This sequence starts and stops for each hydraulic system selected, extracting the relevant nozzle and keeping on with it to the end of the simulation. Whatever nozzle is extracted during a test phase, is not considered.

5. HARDWARE PERSONALIZATION

There are 3 selectors named JP available on the CPU, , placed on the inside of the container protected by metric sealing, which allow to modify the functionality of the computing head in the following way:

➤ JP1   available for future applications

➤ JP2   Allows to perform all setup operations
  - Open   normal delivery
  - Closed   set-up qualified

➤ JP3   Forces the computing head to use parameters relevant to Euro, despite the current set-up:
  - Open   uses set-up values
  - Closed   uses values relevant to Euro
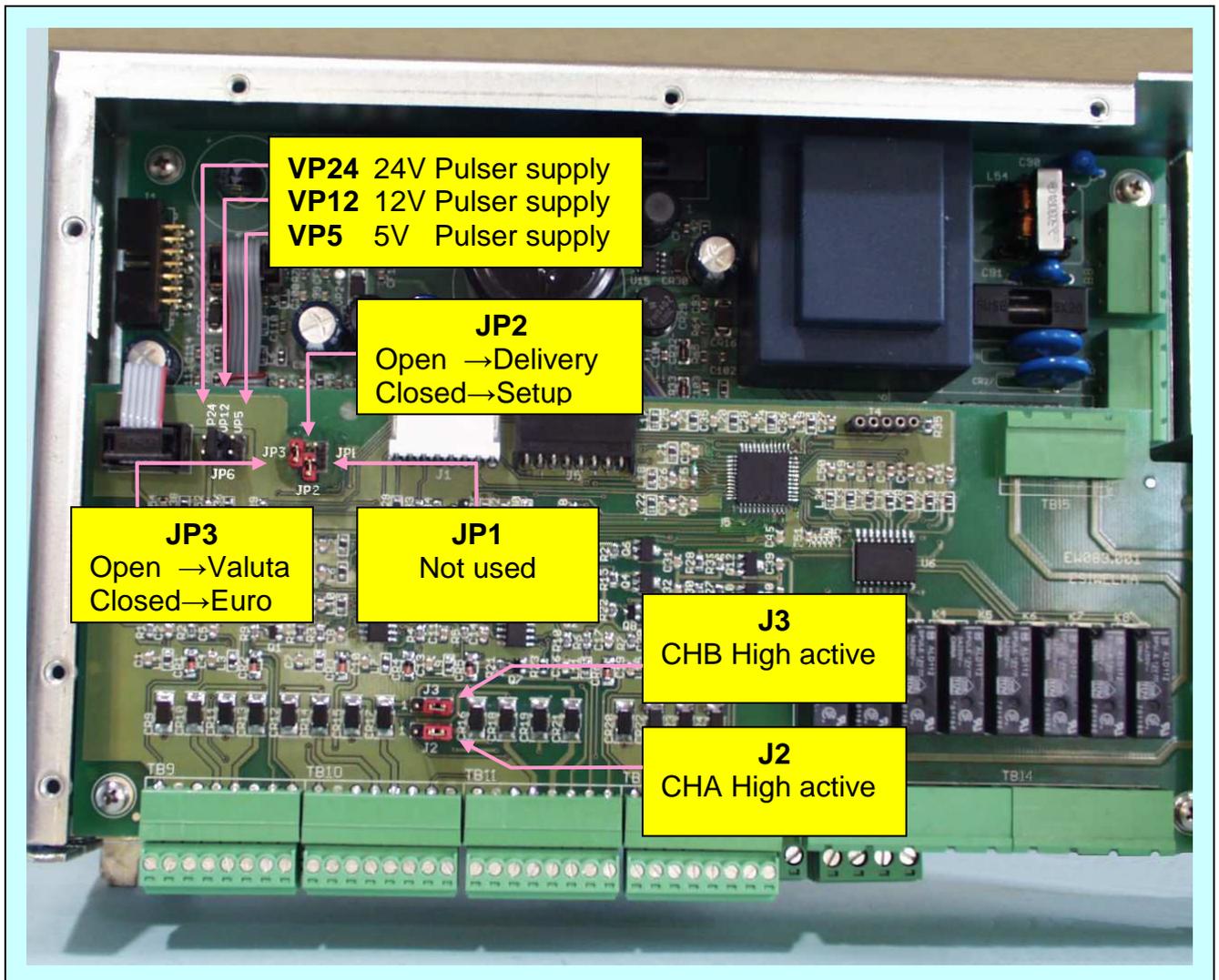
Photo 4: *Jumper on CPU*

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The computing head can adjust itself to the Pulser specifications:

- supply voltage

5V	nominal	insert the Jumper in VP5 position
12V	nominal	insert the Jumper in VP12 position
24V	nominal	insert the Jumper in VP24 position

- Output channel:

High active channels	Jumper J2 and J3 close
Low active channels	Jumper J2 and J3 open

Connection clamps are used only to connect Pulser. To cut the consumption of optical converters, pulser is supplied only when working. For this reason 0Vpulser clamp can be used only to supply pulser itself.

6. OPTIONALS

6.1. External 4x4 keyboard

A 16-key keyboard could be necessary. Both language and functions of this keyboard can be adjusted on customer's demand.

With an external keyboard operator can choose Euro or litre pre-set.

Photo 5: *pre-set keyboard adjustement on customer's demand*

6.2. 12-digit-on-2-line Display

If necessary a second small display can be installed near the keyboard: this display works even for complex procedures such as automatic payment, inserting a password, kilometers covered etc.

In this case display shows:

Date…….Temperature
Time ……Alarm condition

Photo 6: *Second Display*

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6.3. Anomaly signalling device

If a detected anomaly has to be shown in remote, a simple device can be used: it is connected to the same flat cable used for display and allows to activate a free voltage contact by whom a lamp or any other signalling device can be supplied.

Le caratteristiche elettriche sono le seguenti:

➢ Max mains 270Vca or 350Vdc
➢ Output voltage depending on the device used
  – 3A → Relay (Standard)
  – 1A → Solid State devices (Atex non sparking)

***Photo 7:** Anomaly remote signalling device*

Mechanical specifications:

- Fixing method: DIN rail
- Overhall sizes: 90x35x58mm
- Weight: 60g

7. ELECTRICAL CONNECTIONS

7.1. Low Voltage Connections

All tests done by microswitch or push-button are "normally open" and have to close at 0V. Particularly:

- Nozzle contact----------------------------- open when nozzle is in place, close when nozzle is extracted
- Tank level contact ----------------------- changeable in set-up mode
- Alarm contact for fume recovery ------- as above described, in option to tank level
- Manual/automatic contact -------------- chiuso in manuale, aperto in automatico
- Pre-set keys-------------------------------- close in manual mode, open in automatic mode
- Expected pulser -------------------------- Shaft encoder type 01-09 ELTOMATIC

Voltage supply:	4,5-25V
power per canale:	60mA
outputs:	low active
pulses:	2x100xlitre
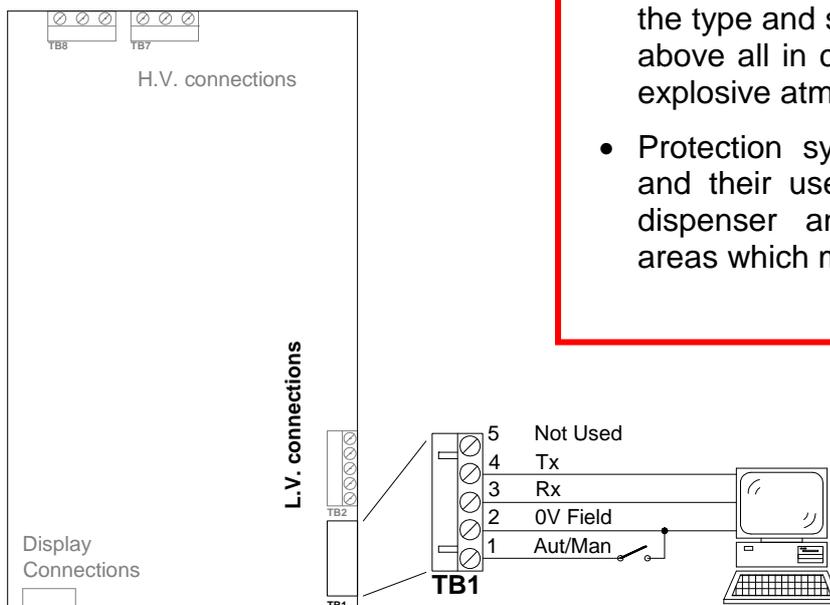
ATTENTION:

- The cable connection schematics given below don't esonerate the installer from rules existing in the country where the device is installed. Moreover the installer has to follow the security rules relevant to the type and specification of the application, above all in case of electric contructions in explosive atmospheres.

- Protection systems (e.g. zener barrieres) and their use depend on the kind of the dispenser and on the classification of the areas which make it up.

TB1 clamp board

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TB2 clamp board

TB8   TB7

H.V. Connections

L.V. Connections

5	Clear
4	10.00€/10Litres
3	5.00€/5Litres
2	Show € value
1	0V Field

TB2

TB2

Display
Connections

TB1
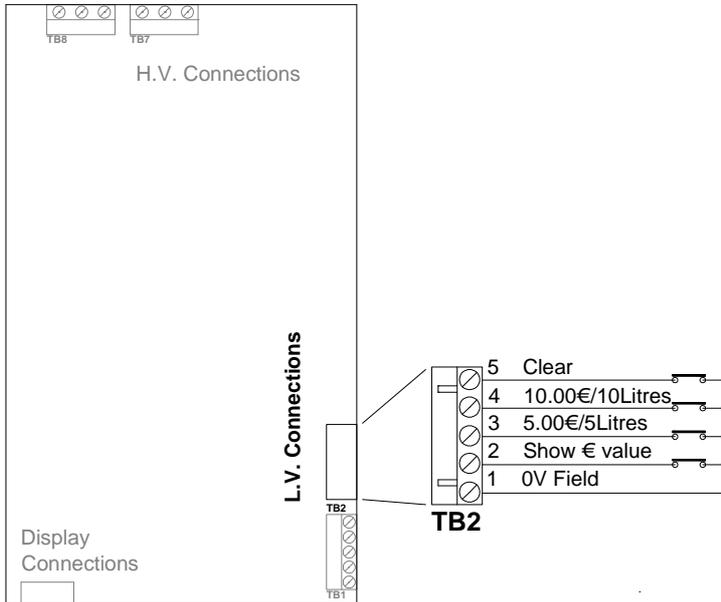
TB9, TB10,TB11,TB12 clamp boards

H.V.Connections

TB14

TB13

L.V.Connections

4° Product   TB12

3° Product   TB11

2° Product   TB10

1° Product   TB9

The same for **TB10, TB11, TB12**

8	Tank Level
7	ChA pulser repeater
6	0V pulser
5	ChB pulser
4	ChA pulser
3	+Vcc pulser
2	0V Field
1	Nozzle

Pulser
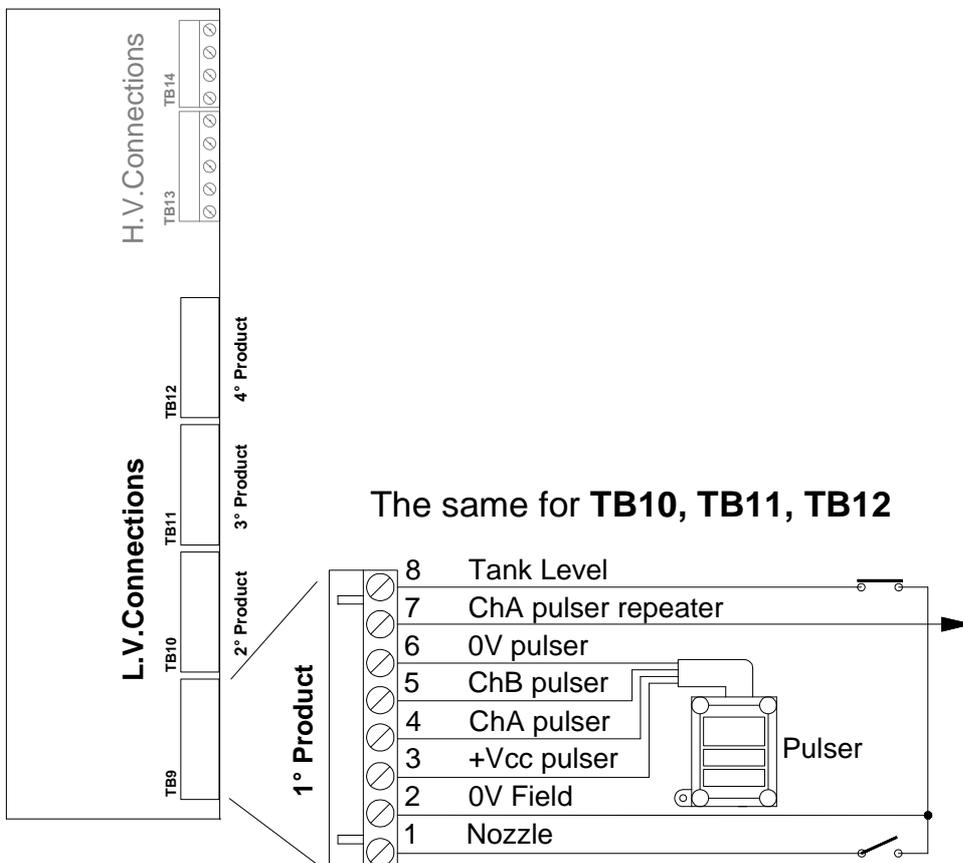
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J1 Connector

Display Connections

J1
To Display Connector

SET - UP Board

Display-1

Display-2

Unit Price Display

Totalizers

Failure Output

Keyboard 4x4

Keyboard Interface
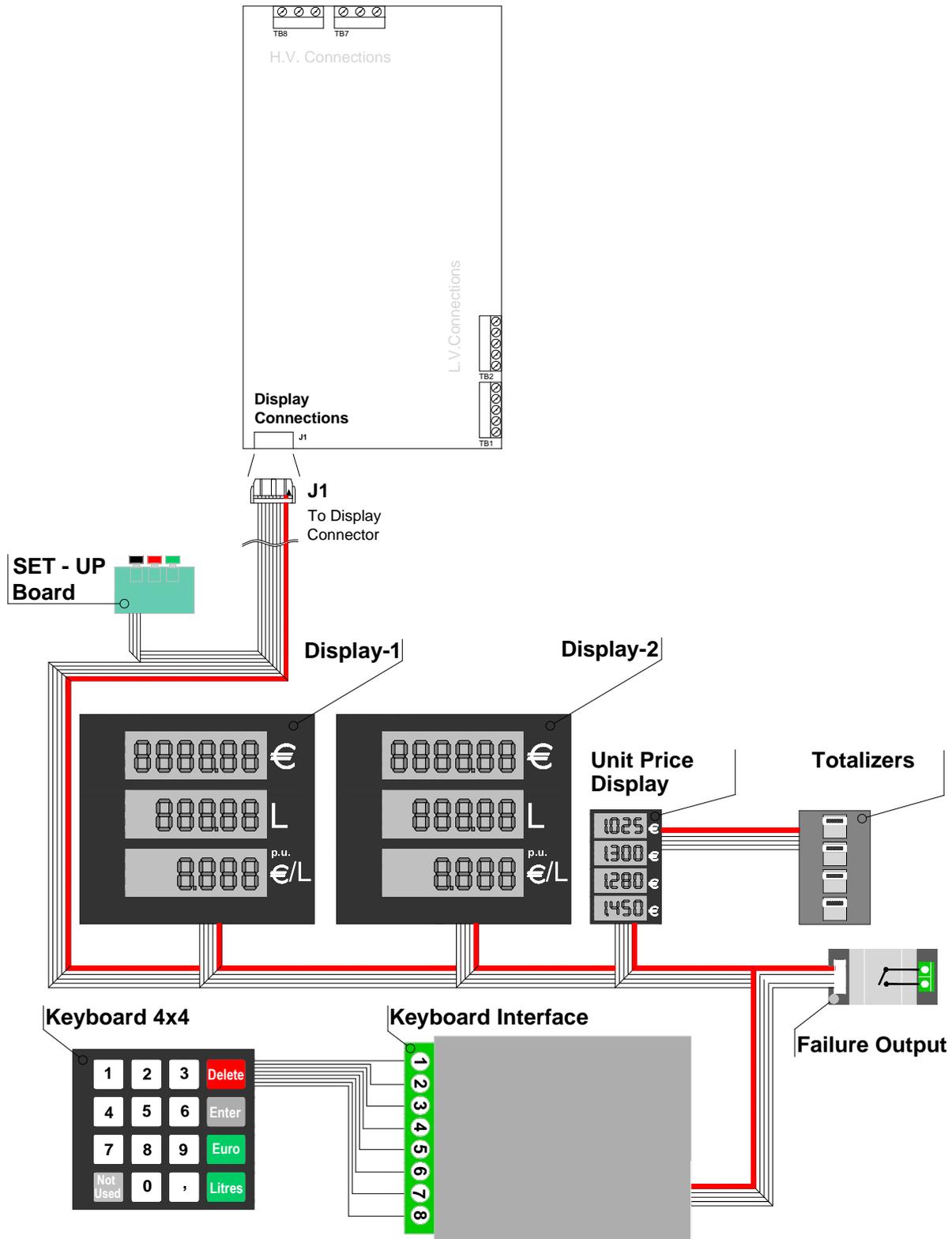
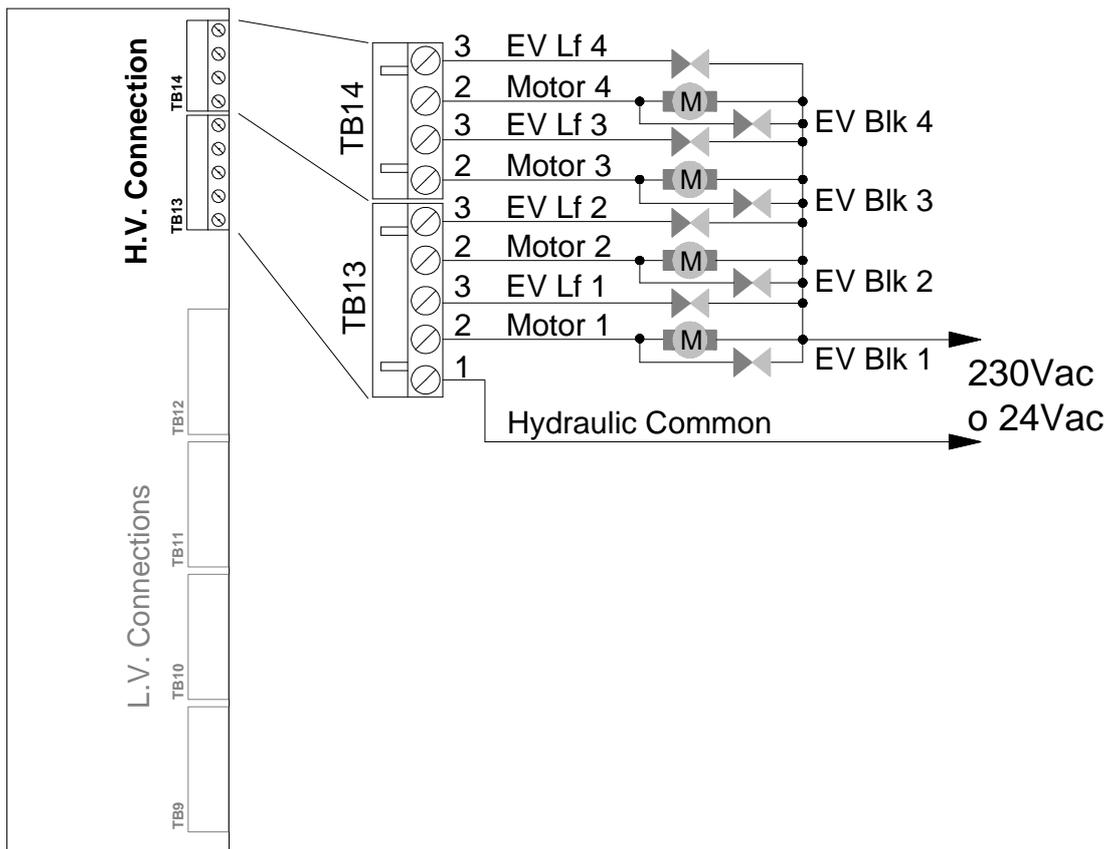| Tipo / N°	Rev.	Fw	Data	Pagina	Pagine totali
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7.2. High Voltage connections

The computing head gives voltage-free contacts which can drive resistive or inductive loads with the following specifications:

max 270Vca/3A Standard /1A Atex **(*)**

(*) Output devices:
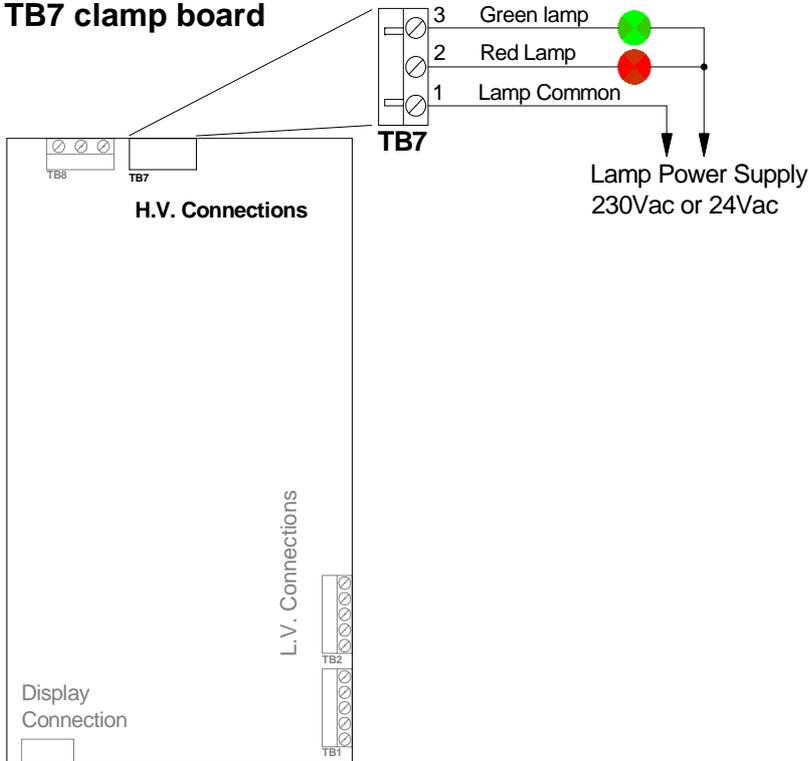Relays for TW1.4-B "Standard",
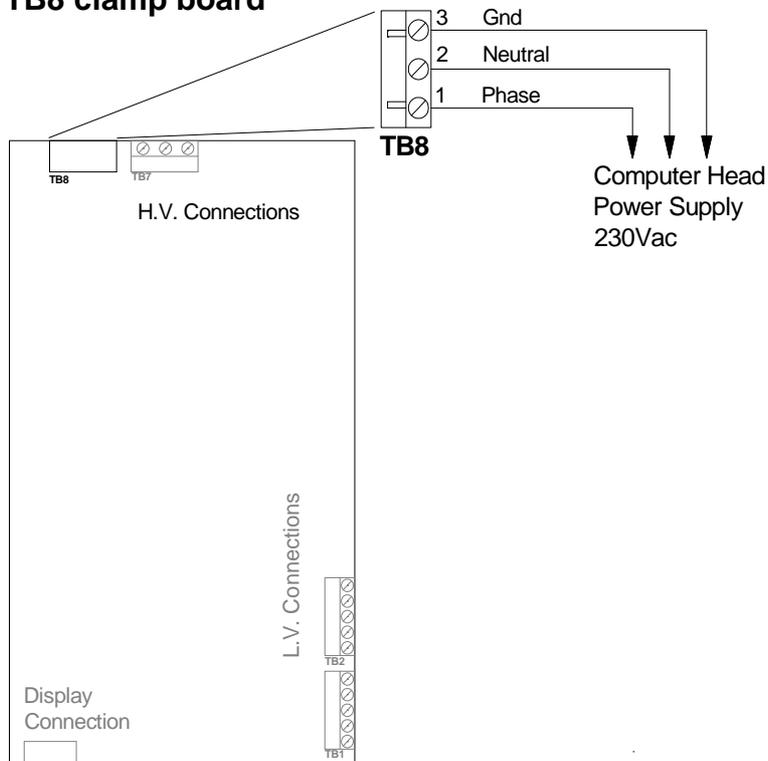or Solid State relays for TW1.4nA-B "ATEX".

TB13 and TB14 clamp boards

TB7 clamp board

3	Green lamp	
2	Red Lamp	
1	Lamp Common	

TB7

Lamp Power Supply
230Vac or 24Vac

H.V. Connections

L.V. Connections

Display
Connection

TB8   TB7

TB2

TB1

TB8 clamp board

3	Gnd	
2	Neutral	
1	Phase	

TB8

Computer Head
Power Supply
230Vac

H.V. Connections

L.V. Connections

Display
Connection

TB8   TB7

TB2

TB1

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8. COMPUTER HEAD TW1.4-B e TW1.4nA-B IDENTIFICATION

In the respect of the standards in force, an identification plate of the product is applied as shown in the figure:
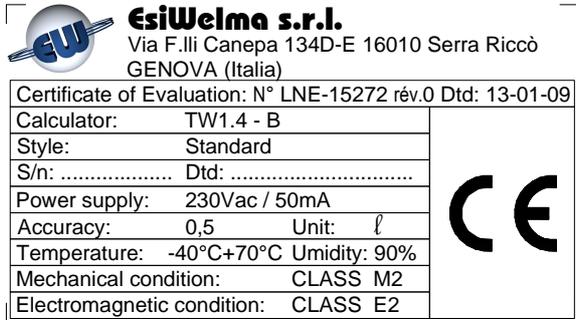

EsiWelma s.r.l.
Via F.lli Canepa 134D-E 16010 Serra Riccò
GENOVA (Italia)

Certificate of Evaluation: N° LNE-15272 rév.0 Dtd: 13-01-09		
Calculator:	TW1.4 - B	
Style:	Standard	
S/n:	Dtd:	
Power supply:	230Vac / 50mA	
Accuracy:	0,5	Unit: ℓ
Temperature:	-40°C+70°C Umidity: 90%	
Mechanical condition:	CLASS M2	
Electromagnetic condition:	CLASS E2	

C E

Figura 33: TW1.4-B; "Standard" Identification plate

EsiWelma s.r.l.
Via F.lli Canepa 134D-E 16010 Serra Riccò
GENOVA (Italia)

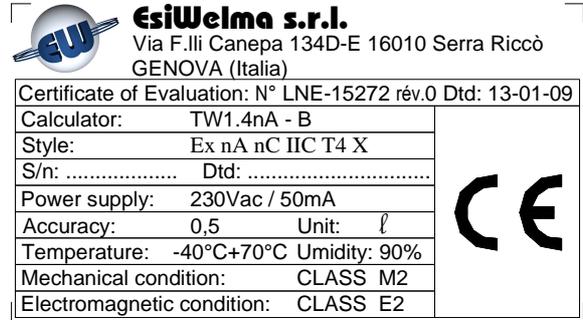| Certificate of Evaluation: N° LNE-15272 rév.0 Dtd: 13-01-09		
Calculator:	TW1.4nA - B	
Style:	Ex nA nC IIC T4 X	
S/n:	Dtd:	
Power supply:	230Vac / 50mA	
Accuracy:	0,5	Unit: ℓ
Temperature:	-40°C+70°C Umidity: 90%	
Mechanical condition:	CLASS M2	
Electromagnetic condition:	CLASS E2	

C E

Figura 34: TW1.4nA-B; "Atex" Identification plate

On the plate the following data are shown:

- Device manufacturer.
- Address.
- CET (Type Examination Certificate).
- Device type.
- Application Area.
- Device identifying S/n and date.

- Power supply tension (voltage) and Current consumption.
- Measure Unit.
- Environmental Condition.
- Mechanical condition.
- Electromagnetic condition.

Photo 8: *Computing head TW1.4-B identification plate*

9. MECHANICAL CLAMPING

The CPU of the computing head is settled into a metallic box which can be clamped in a vertical as well as a horizontal position.
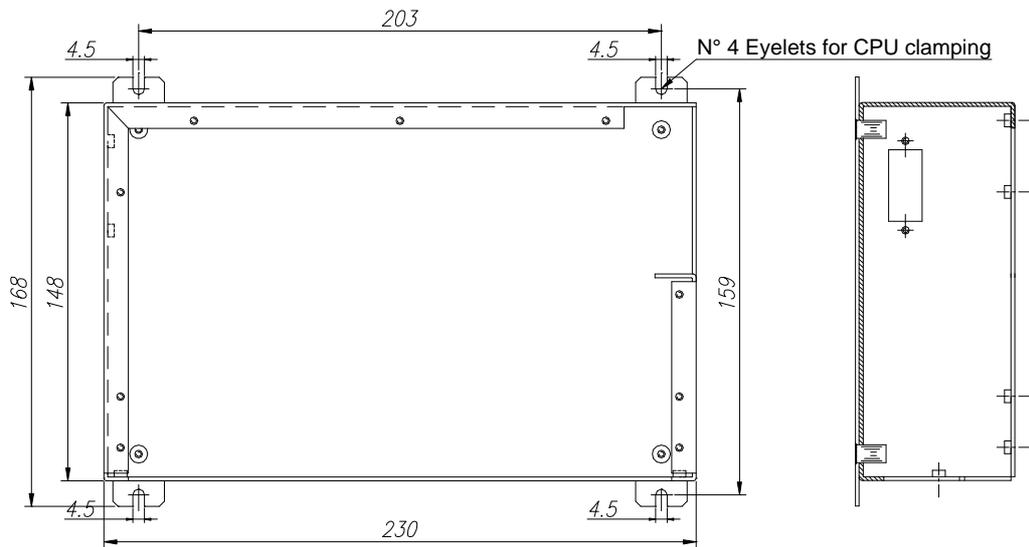Some tangs assure a correct clamping:

Figura 35: Clamping of the CPU box

There are some clamping points also for displays. The tangs settled in the centre are not clamping points, but eyelets for legalizing leads.
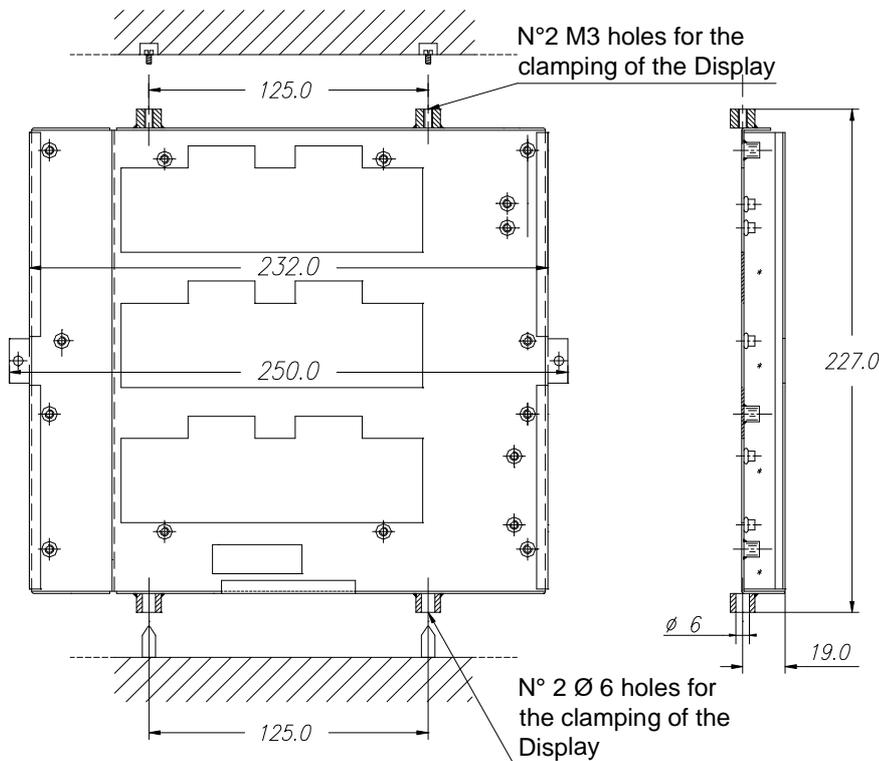

Figura 36: Clamping of the display box

EsiWelma s.r.l.

10. LEGALIZING PROCEDURE OF THE COMPUTING HEAD TW1.4-B and TW1.4nA-B

10.1. CPU legalization plan

Lead keeping from removing the CPU case and access to the card.

Lead keeping from removing the display cable.

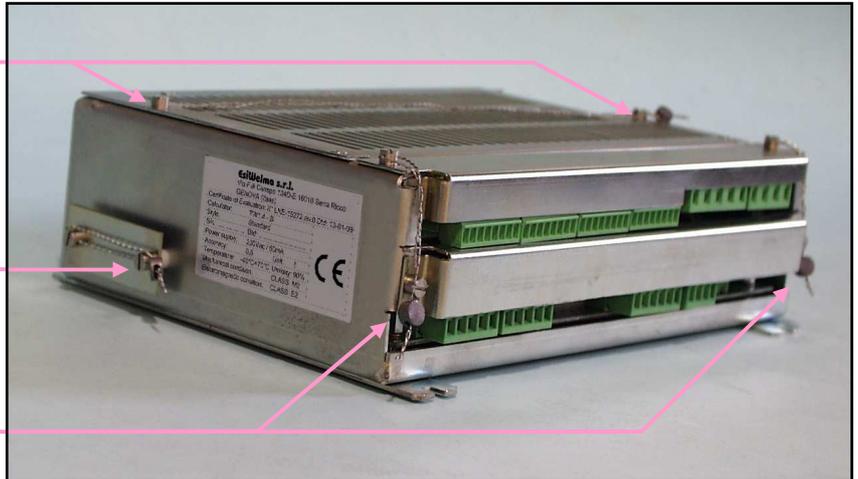Lead keeping from removing the connection to field.

Photo 9: *Computing head TW1.4-B and TW1.4nA-B, CPU front view*

10.2. Display legalization plan

Photo 10: *Computing head TW1-4 TW1.4nA-B Display front view*

Lead that prevents from removing the display from dispenser.

Lead blocking access to the display card.

It is possibile to use both left and right hole .
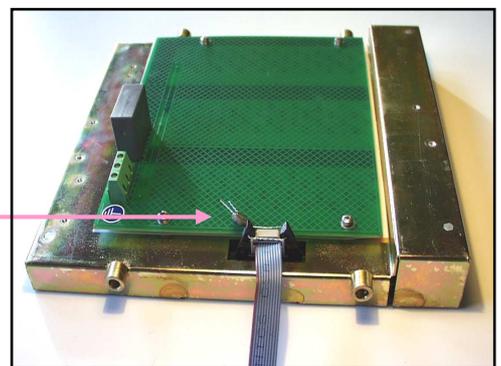
Lead keeping from removing the display cable.

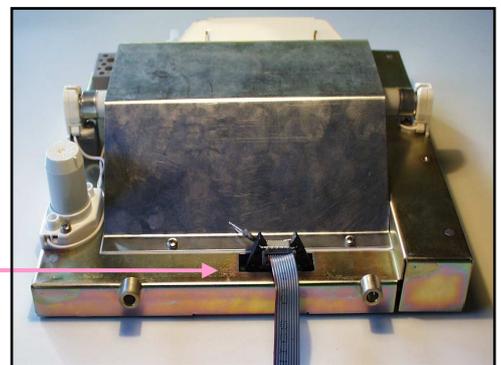**Photo 11:** *Computing headTW1.4-B and TW1.4nA-B Display rear view*

Photo 12: *Computing head TW1-B and TW1nA-B Display rear view Neon tube back-lighting version.*

Notes

The spiral that keeps from removing the containers (CPU and Display) from the dispenser must be fastened to a part that cannot be moved from the dispenser.