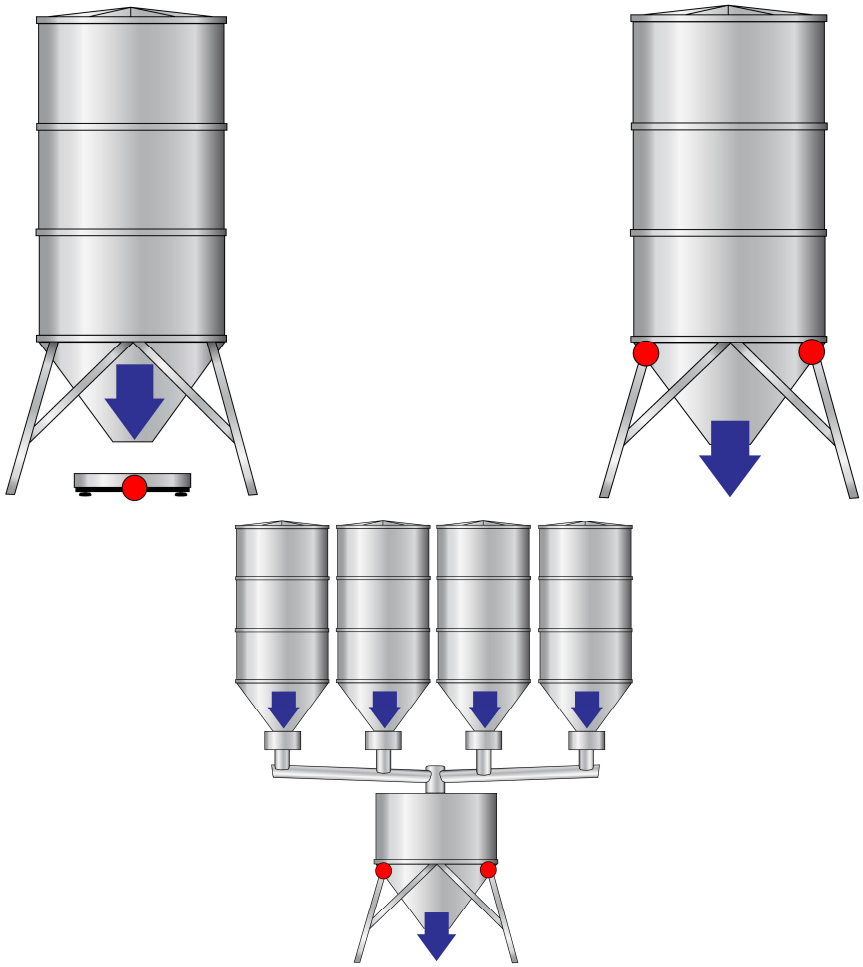
TECHNICAL MANUAL
WEIGHT INDICATOR

DGTPKF: MICROCONTROLLER FOR INDUSTRIAL DOSAGE SYSTEMS WITH EXTENDED KEYBOARD



```
**********************
FORMULA       000
CYCLE REPORT 001
27/12/07 11:15:13
**********************
00 AUTOM. DOSAGE
DOSE              50kg
DOSED             50kg
01 MANUAL DOSAGE
DOSE              50kg
DOSED             50kg
02 UNLOAD  SPLIT
DOSE              30kg
UN. 001           30kg
UN. 002           30kg
UN. 003           30kg
03 UNLOAD  TOTAL
**********************
TARGET           100kg
DOSED            100kg
27/12/07 11:16:03
* IN TOLERANCE     *
```

DGTPKF series indicator

INDEX

NOTE FOR THE TECHNICIAN:

Please take note that when the "StEP…. (**USER MAN.REF**.) is mentioned, this refers to the user manual.

1. REQUIREMENTS FOR AN EFFECTIVE INSTALLATION

To obtain the best results it is recommended to install the indicator and the platform (or transducer) in a place with the following conditions:

- **Stable and vibration free**
- **Moderate temperature and humidity (15-30°C and 40-70%)**
- **No dust or strong vapours**
- **No draughts**
- **Mains power supply is restricted to within ± 10% of the rated voltage**
- **Make sure the platform is level or that the loading cells are resting evenly**
- **Avoid welding with load cells installed.**
- **When the load cells are used with assembling kits under storage bins or the like, connect the upper and lower supporting plate with a copper wire cable and then earth all the upper plates.**
- **Use waterproof sheaths and couplings in order to protect the load cell cables.**
- **Use a waterproof junction box to connect the cells.**
- **The extension leads of the load cells or signal amplifiers must be screened. In addition they must be laid on their own in a raceway or metal pipe as far away as possible from the power supply cables.**
- **Connection of the cell or amplifier cables on the electrical panel shall be independent and, if possible, connected directly to the indicator's terminal board without laying other cables in the raceway.**
- **Install "RC" filters on the contactor coils, on the solenoid valves and on all devices producing electric disturbances.**
- **If it is possible that condensation could form inside the weight transmitter it is advisable to leave the instrument powered at all times.**
- **Electric protections (fuses etc.) are provided by the technician installing the instrument.**
- **Do not install anywhere where there is the risk of explosion.**

2. CONNECTIONS

2.1 CONNECTION TO THE LOAD RECEIVER

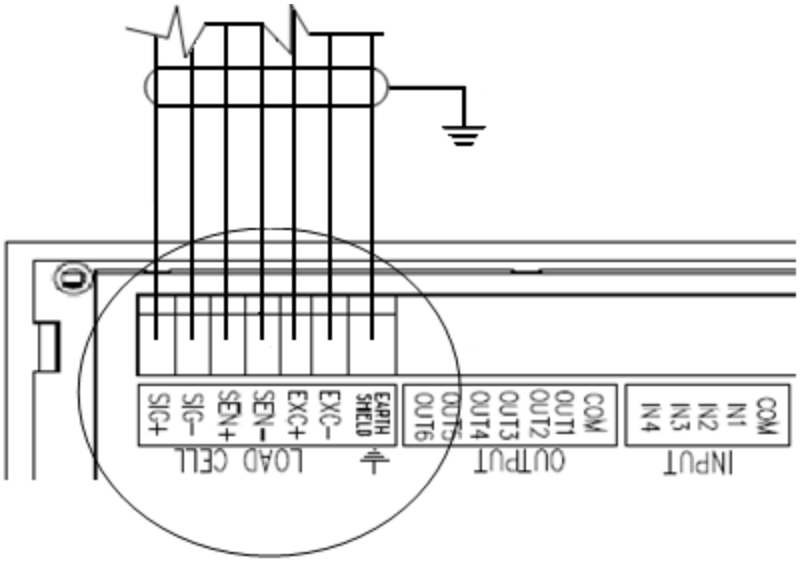
After having followed the instructions regarding the platform or the load receiver, the screened cable leading from the load cell(s) must be connected to the instrument through the CELL1 terminal board or the CELL1, CELL2, CELL3, CELL4 connector see paragraph "CONNECTION SCHEME", through the relative input(s) (see paragraph "INSTALLATION", **USER MAN. REF.)**.

The CELL1 terminal board of the indicator may be connected to the 6-wire load receiver (with use of SENSE), or simply 4-wire; for this, through jumper J3 and J4 (normally closed) it is possible to choose whether to short-circuit the SENSE with the POWER SUPPLY (jumpers closed) or not (jumpers open).

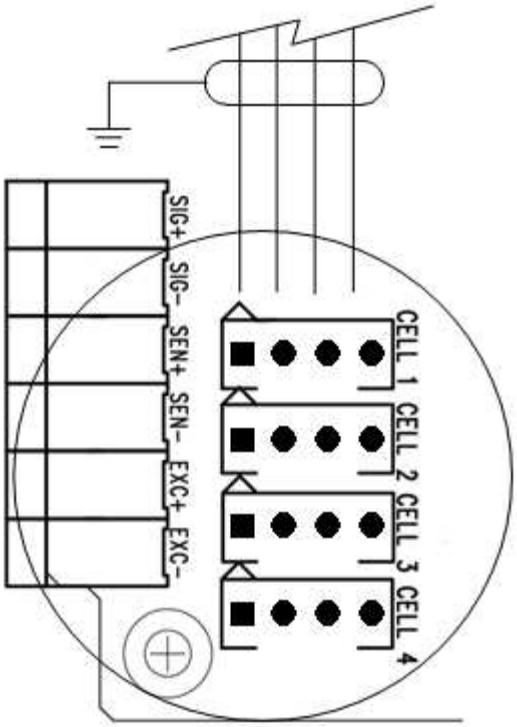
The sense allows compensating for any drops in voltage in the part of the cable that connects the instrument to the transducer. It is useful when the distance between the indicator and the transducer is greater than 10 m.

The 4-pin CELL1, CELL2, CELL3 e CELL4 connectors instead allow just the 4-wire connection.

6-WIRE CONNECTION



4-WIRE CONNECTION



!! IMPORTANT !!

- If one wants to use 4 wires in the CELL 1 terminal board or in the C1 connector (without using the SENSE signal), one should short-circuiting - SEN with -EXC and +SEN with +EXC by closing the J3 and J4 jumpers.

- When there are 6-wire cells:
  1) the SENSE is managed exclusively in <u>systems with just one cell</u>, connected to the CELL1 terminal board; in these applications, open the J3 and J4 jumpers.

  2) <u>in sistems with various cells</u>, the SENSE is not managed, therefore for each cell:
     - Shortcircuit the +SENSE wire with the +EXC wire and the –SENSE wire with the –EXC wire; otherwise one may leave the SENSE wires unconnected.
     - Close the J3 and J4 jumpers.

2.2 EARTHING SYSTEM

For the right earthing and the optimal functioning of the system, it is necessary to connect the indicator, the load cells, the possible junction box and the weighing structure to the earth.

INDICATOR

Ground terminal 2 (GND) (see section 8.1) using a copper cable with a section not less than 2,5 mm^2.

LOAD CELLS AND JUNCTION BOX

- In the case the load cells are connected to the indicator through a junction box, it is necessary to connect the sheathing both of cells cables and of indicator cable to the earthing of the junction box (refer to the junction box manual) and connect this to the earth through copper cables having at least a 16 mm^2 cross-section.
- In the case the load cells are directly connected to the indicator (without the junction box), it is necessary to connect the sheathing of cells cables to the earth through copper cables having at least a 16 mm^2 cross-section.

Moreover in both cases it is required to:

- Connect the upper side of every cells to the lower side using a copper braid having at least 16 mm^2 cross-section; the upper side must be short-circuited with the surface of the weighing structure and the lower one must be connected to the earth using a copper braid having at least 16 mm^2 cross-section.
- Use Earth plate of suitable length, in order to obtain a **total resistance of earthing plant lower than 1 Ω**.

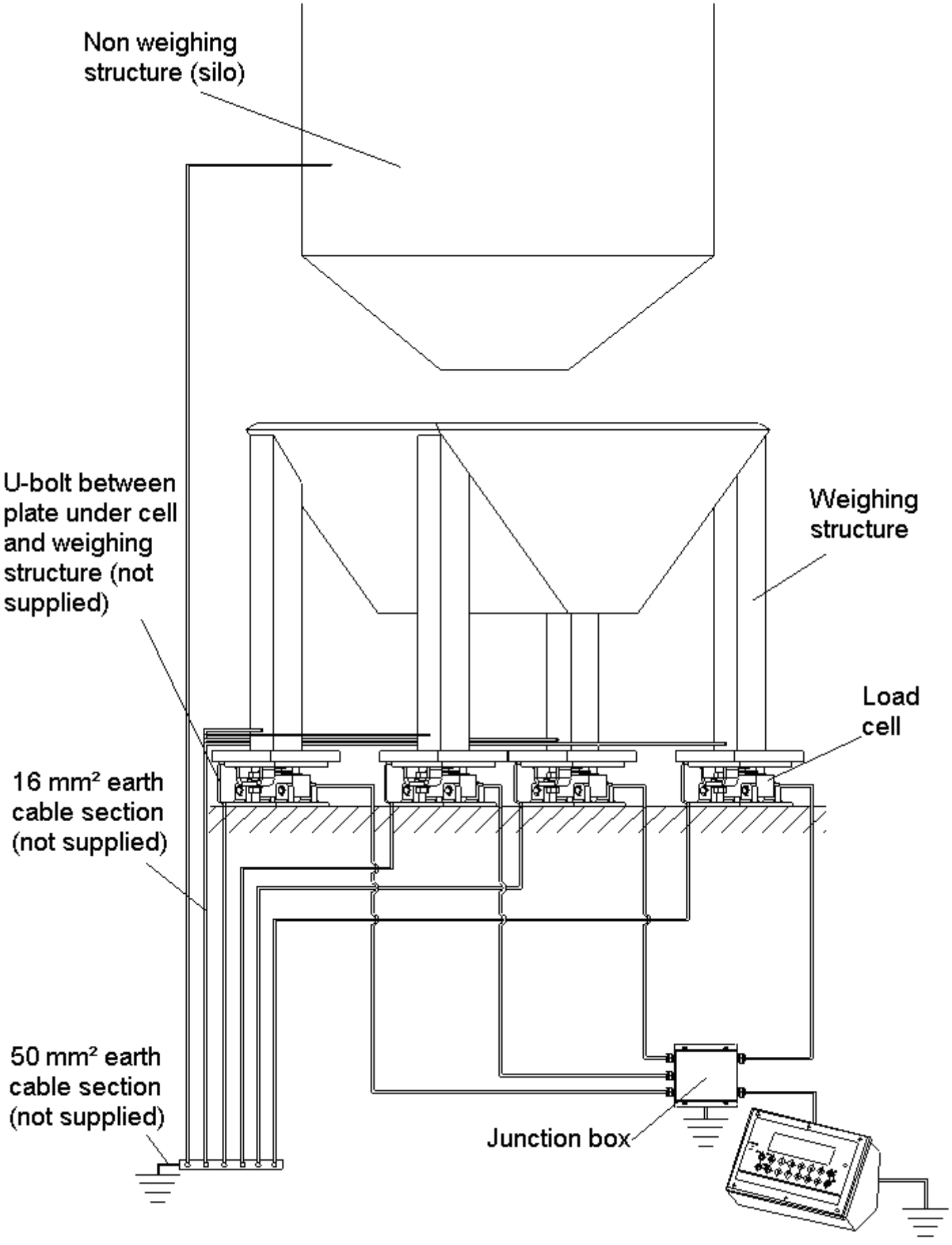
WEIGHING STRUCTURE

Connect the weighing structure and the possible connected structures (for example silos that release material on the weighing structure) to the earth through copper cables having at least a 16 mm^2 cross-section.

NOTES:

- In the case the weighing system regards great and/or outdoor structures, the cross-section must be greater (for example 50 mm^2), because the voltage into play is greather (for example thunderbolts).
- In order to avoid possible undesired effects, if there are other shielded cable connected to the indicator (for instance, PC cable) the shield should be earthing only on the cable termination towards the indicator.
- Every shielded cable or not (for instance PC cable, cell cable, power supply cable) connected to the indicator should be as shorter as possible, then you have to come out of the shield the minimum length of cable, go three round around a ferrite ring and then connect to the terminal box.
- If the indicator is situated inside an electric panel, the power supply cable should be a shielded cable as shorter as possible, distant from every coil supply cable, inverter, electromotive force, etc. and in addition dedicate an uncoupler transformer in order to feed the indicator only.

EARTHING EXAMPLE



3. SETUP ENVIRONMENT

With "SETUP ENVIRONMENT" we intend a specific menu, inside which it's possible to set all the functioning parameters of the indicator.
To enter it, turn on the instrument and, while the firmware version is displayed, press the TARE key for an instant. The indicator shows the first parameter "teCh" ("oinL", in case of approved instrument).

NOTE: THE METROLOGICAL PARAMETERS of the SETUP ARE normally NOT ENABLED and therefore are just displayed.
To enable them, open the instrument and close the proper jumper (CAL) (see the "CONNECTIONS SCHEMES" chapter).

Functions assumed by the keys in the SETUP ENVIRONMENT:

ZERO Scrolls the programming steps forward in sequence.
If one needs to enter a numeric value, this decreases the digit to be modified (blinking).

TARE Allows to scroll backwards through the programming steps.
In the case in which one enters a numeric value, the selected digit (blinking) increases.

MODE Allows to quickly position on the first step of a menu.
In the case in which one needs to enter a numeric value, select the digit to be modified (blinking) from left to right.

PRINT Allows to enter a step or confirm a parameter inside a step.

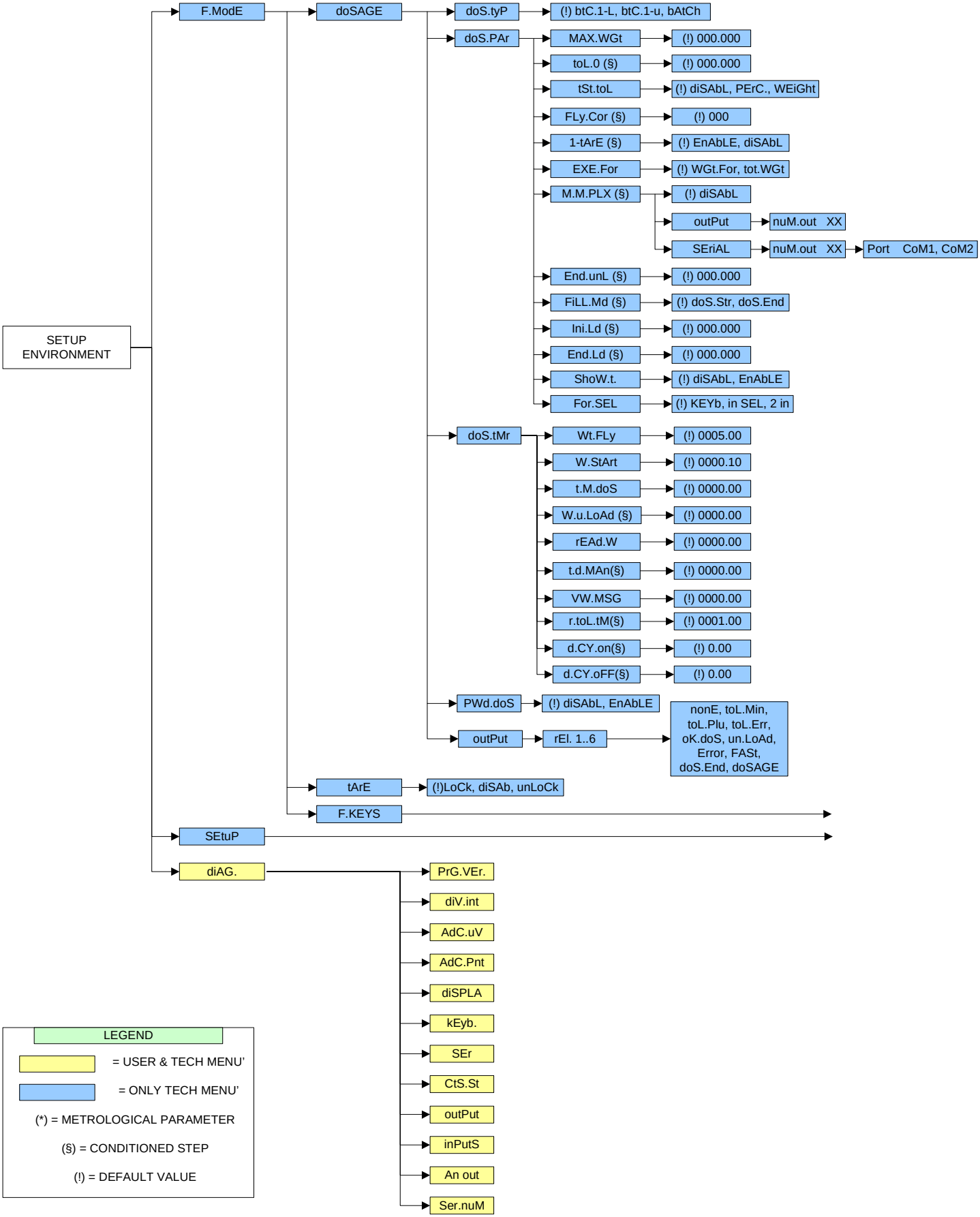
C-ON/Stb Allows to exit a step without confirming the possibly modified parameter and go to the preceding level.
When entering a numeric value it quickly zeros the displayed value.

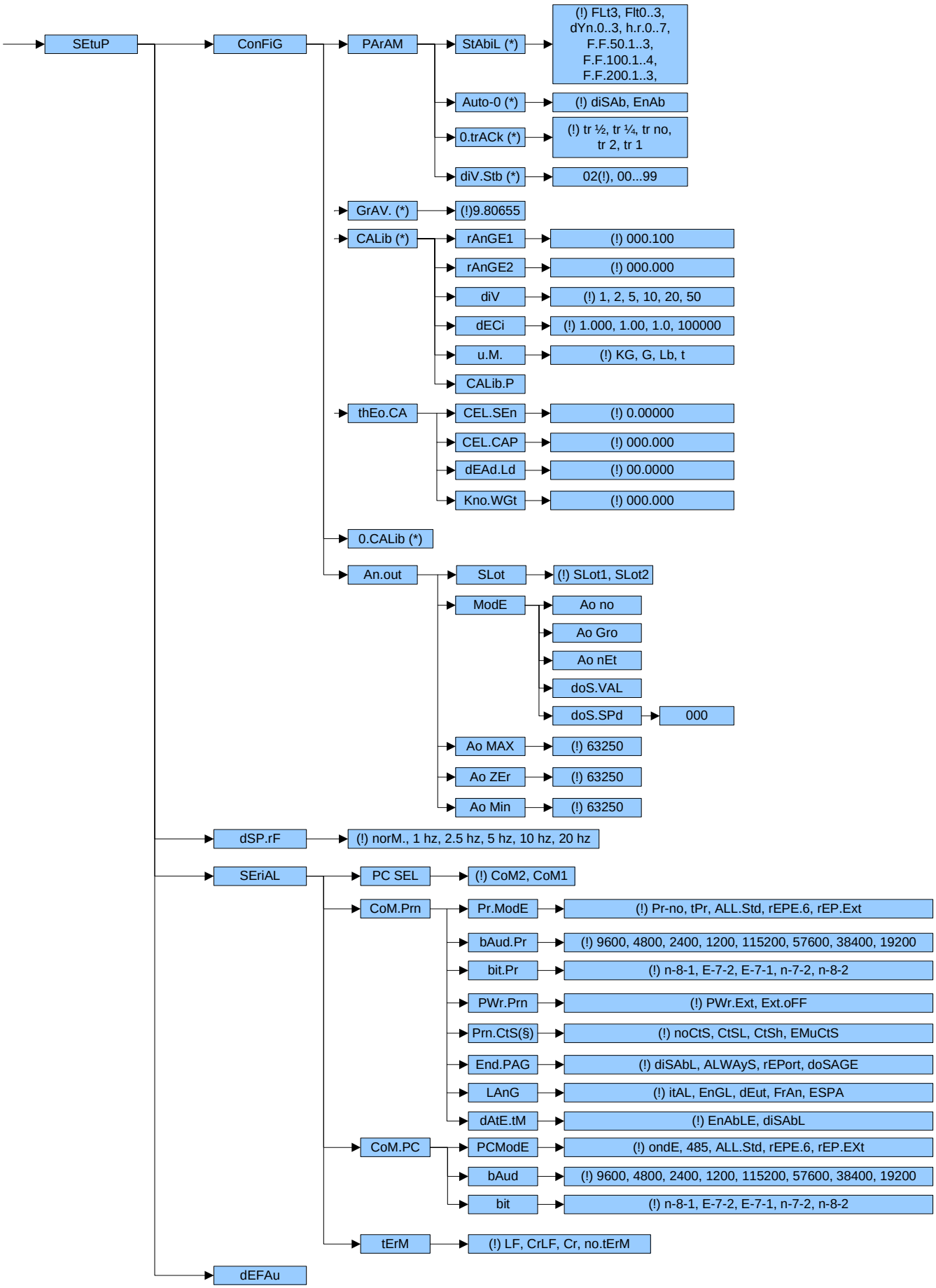
NUMERIC KEYS Allow to enter numeric values, from right to left.

The display indicates the abbreviation of the step whose meaning is described below. The values indicated with the **(!)** symbol at the end of the step, are values set by DEFAULT.

TO EXIT THE SETUP ENVIRONMENT, PRESS THE "C - ON/Stb" KEY MANY TIMES UNTIL THE INDICATOR SHOWS "SAVE?" IN THE DISPLAY: CONFIRM WITH PRINT TO SAVE ANY CHANGES MADE OR PRESS ANOTHER KEY TO NOT SAVE.

3.1 SETUP ENVIRONMENT BLOCK DIAGRAM





(§) = shows that **the parameter is visible only in certain programming conditions; see the explanation of the parameter for the details.**

(*) = shows that **with an approved instrument the parameter could be not visible or not enterable; see the explanation of the parameter for further details.**

3.2 DESCRIPTION OF THE STEPS

<<F.ModE>> FUNCTIONING MODE

➢ <<doSAGE>> CONFIGURATION OF DOSAGE

▪ <<doS.tyP>> SELECTION OF THE TYPE OF DOSAGE

btC.1-L: single-component dosage in loading
btC.1-u: single-component dosage in unloading
bAtCh: multicomponent dosage

(!) btC.1-L

Note: if the type of dosage was changed, for an instant "E2.init" is displayed to indicate the EPROM initializing

▪ <<doS.PAr>> DOSAGE PARAMETERS

♦ <<MAX.WGt>> MAXIMUM WEIGHT ON THE SCALE

This is the maximum weight value which can be loaded onto the scale when executing a formula.
When checking whether the weight on the scale is greater than the maximum weight, the indicator takes into consideration also the weight zeroed when the dosage is started.
It is also the value which is taken into consideration, in the various modes, in order to establish the maximum dosable weight in a single dosage (**USER MAN.REF**.).

NOTE: min = 0, MAX = Scale capacity

(!) Scale capacity

♦ <<toL.0>> ZERO TOLERANCE WEIGHT

Only for dosages in loading

This is the maximum weight which can be on the scale when the dosage is begun; this value is ignored if the minimum and maximum tare weights have been entered for the selected formula.
Programmed at 0, it has no effect.

NOTE: min = 0, MAX = Scale capacity

(!) 000.000

♦ <<tSt.toL>> CHECK OF DOSAGE WEIGHT TOLERANCE

In every dosage type, at the end of every dosage in loading or unloading, it is possible to check the dosage weight, verifying that it is within tolerance.

<<diSAbL>> Check disabled.
<<PErC.>> Check enabled in percentage of target.
<<WEiGht>> Check enabled by using a specific weight

NOTES:
- enabling the tolerance test, it is possible to utilize the relays function for the control light management, in the manual dosage in loading.
- enabling the tolerance test, the function of flight automatic correction, for the automatic dosage.
- The tolerance range is a parameter which is programmable in each formula (for the BATCH1-L/BATCH1-u functioning modes) or in each activity (for the BATCH functioning mode)

(!) diSAbL

♦ **<<FLY.Cor>> AUTOMATIC FLIGHT CORRECTION (§)**

In every dosage mode, in the automatic dosages in loading and unloading, it allows to set the flight correction percentage, applying to the selected formula.

At the end of each dosage cycle within tolerance, the correction calculates the new material flight weight depending on the previous dosage error (dosed weight – target): if the weight just dosed is lower or higher than the set target, the instrument calculates a percentage of the error and sums it to the weight programmed in the formula.

Examples:
With a flight weight correction equal to 30%, and if the formula's flight weight is equal to 5 kg, the target is equal to 500 kg and the last dosed weight is equal to 510 kg, the instrument applies a flight weight correction equal to:
[(510 - 500)/100] x 30 = 3 kg, so the new flight weight would be 8 kg.
If the last dosed weight is equal to 490 kg, the instrument applies a flight weight correction equal to:
[(490 - 500)/100] x 30 = - 3 kg, so the new flight weight would be 2 kg.

The 0 value disables the automatic flight correction.
NOTE: min= 0%; max= 100%

(!) 000

(§) The parameter is displayed only if the tolerance test is enabled.

♦ **<<1-tArE>> ENABLING TARE AT THE DOSAGE START**
Only for dosages in loading

It is possible to select whether the gross weight on the scale is tared or not at the dosage start.

<< EnAbLE >> : the gross weight on the scale is entirely tared; therefore the dosage always starts with the net weight at zero.
<< diSAbL >> : the gross weight on the scale is considered to be the dosage start weight.

While if a semiautomatic or manual tare is entered, the net weight is considered to be the dosage start weight, independently of this step value.

(!) EnAbLE

♦ **<<EXE.For>> DOSING WEIGHT SETTING MODE**

<<WGt.For>> FORMULA WEIGHTS: in every dosage type this functioning mode provides the use of instrument's formulas database; in fact, in order to dose various quantities of material, it is necessary to select various formulas in the database (see the ""FORMULA TARGET" FUNCTIONING MODE" sections (**USER MAN.REF**.)).

<<tot.WGt>> RECALCULATION OF WEIGHTS IN RESPECT TO TOTAL:

btC.1-L mode: one can set in quick mode the target weight of the formula.
It's sufficient to insert a single basic formula; the flight weight, the slow weight and the tolerance will be not modified (see the "RECALCULATION OF WEIGHTS IN RESPECT TO TOTAL" FUNCTIONING MODE" section, **USER MAN.REF**.).

btC.1-u mode: one can set in quick mode the target weight of the formula.
It's sufficient to insert a single basic formula; the flight weight, the slow weight and the tolerance will be not modified (see the ""RECALCULATION OF WEIGHTS IN RESPECT TO TOTAL" FUNCTIONING MODE" section, **USER MAN.REF**.).

bAtCh mode: by entering the total weight which one wants to dose, the instrument recalculates the target weight of each single component of the formula, in proportion to the original total.
It is advisable to enter the formula targets as percentages (see the 10.12 section, **USER MAN.REF**).

(!) WGt.For

- **<<M.M.PLX>> MULTIPLEXED OUTPUTS**

Only for BATCH mode

<<diSAbL>> disabled function;
<<outPut>> the 3 outputs (R4/R5/R6) can be codified so that there can be 8 possible combinations.
<<SEriAL>> not used in this application

The STROBE signal (R3), data ready, is activated after the combination of output relays has been selected, and it is deactivated before changing it.
The OUTPUT NUMBER used in the programming of the FORMULAS ARCHIVE has to be between 01 and 9. If one sets 00 as the output number no relay will be activated.
R1: Function associated at the output 1 (see the F.MODE→DOSAGE→OUTPUT Step)
R2: Function associated at the output 2 (see the F.MODE→DOSAGE→OUTPUT Step)
R3: STROBE
R4: OUTPUT DATA 1
R5: OUTPUT DATA 2
R6: OUTPUT DATA 4

R6	R5	R4	OUTPUT NUMBER
0	0	0	01
0	0	1	02
0	1	0	03
0	1	1	04
1	0	0	05
1	0	1	06
1	1	0	07
1	1	1	08

(!) diSAbL

- **<<End.unL>> UNLOADING END THRESHOLD**

Only for dosages in loading

btC.1-L mode: this is the total unloading end threshold; when the weight is lower, the instrument waits for the **<<W.u.LoAd>>** time and disables the R3 output.

bAtCh mode: the inserted value has different functions depending on the type of unloading in the formula:
- Total unloading: when the weight reaches the **<<End.unL>>** threshold, the instrument waits for the **<<W.u.LoAd>>** time and disables the programmed unloading output, causing the end of the total unloading.
- Splitted unloading: when the weight on the scale is lower than the (TARGET + **<<End.unL>>**) threshold, the instrument finishes the splitted unloading cycle.
- Partial unloading: when the weight on the scale is equal or greater than the (TARGET + **<<End.unL>>**) threshold, the set TARGET is unloaded, otherwise the instrument signals the "**Err.04**" message.

(!) 000.000

- **<<FiLL.Md>> FILLING MODE**

Only for btC.1-u mode

The instrument is able to manage the dosage silo refill, with a dedicated output (R3).

The check on the material level can be done in two different ways:

<<doS.Str>> : check at the start of the dosage;
<<doS.End>> : check at the end and at the start of the dosage.

If the material level is lower than the TARGET + **<<ini.Ld>>** threshold, the instrument recalls the refill function; the refill ends as soon as the weight exceeds the refill end threshold, **<<End.unL>>**.

(!) doS.Str

- **<<ini.Ld>> REFILL START THRESHOLD**

Only for btC.1-u mode

In this step one can enter the threshold, added to the selected formula TARGET, that defines the start of silo refill (in other words, the activation of the dedicated output, R3).

(!) 000.000

- **<<End.Ld>> REFILL END THRESHOLD**

Only for btC.1-u mode

In this step one can enter the threshold that defines the end of silo refill (in other words the deactivation of the dedicated output, R3).

NOTE: it is not possible to introduce a refill end threshold lower than the set refill start threshold, and of course it can not be greater than the maximum dosable weight on the scale.

(!) 000.000

- **<<ShoW.t.>> DISPLAY OF THE WEIGHT MISSING FROM THE TARGET**

<<diSAbL>>: during the dosage, the display shows the weight actually dosed.

<<EnAbLE>>: during the dosage, the display shows the weight that is missing from reaching the target, with a positive sign, and the weight that exceeds the target value, with a negative sign.

(!) diSAbL

- **<<For.SEL.>> FORMULA SELECTION MODE**

The selection of the formula to be carried out takes place in one of the modes shown below:

KEYb selection from keyboard.

in SEL selection through the binary combination of 2 external inputs (IN3 and IN4)

IN3	IN4	SELECTED FORMULA
0	0	0
0	1	1
1	0	2
1	1	3

2 in selection of previous/following formula through 2 external inputs (IN3 and IN4)
IN3: next formula
IN4: previous formula

Note: by selecting the step in SEL , it's possible selecting the formulas with index from 0 to 3 (firsts 4 formulas)

(!) KEYb

▪ <<doS.tMr>> TIMES CONCERNING DOSAGE

- **<<Wt.Fly>> FLIGHT WAITING TIME (sec.)**

In the automatic dosages, both in loading and in unloading, the dosage is interrupted when the TARGET minus the MATERIAL WEIGHT IN FLIGHT is reached; after this, a wait time equal to the value of this step starts, during which one presumes that there is still material on the scale and the FINAL WEIGHT is reached. Programmed at 0, it has no effect.

NOTE: t min= 0.00 sec ; t max= 9999.99 sec

(!) 0005.00

♦ **<<W.StArt>> WAIT TIME FOR THE START COMMAND (sec.)**

Every dosage can starts only if the weight is stable at the start; once the instrument receives the start command, or at the new cycle start (in case of repetitions), it check the weight stability for the time set in this parameter and, if the weight is stable, the dosage can starts, otherwise the instrument signals the "**Err.05**" error.

Programmed at 0, it has no effect.

NOTE: t min= 0.00 sec ; t max= 9999.99 sec

(!) 0000.10

♦ **<<t.M.doS>> MAXIMUM TIME FOR THE DOSAGE (sec.)**

Maximum time for the formula execution. Once this time has passed from the beginning of the dosage, if the formula is not ended, the instrument signals the "**Err.06**" error.

Programmed at 0, it has no effect.

NOTE: t min= 0.00 sec ; t max= 9999.99 sec

(!) 0000.00

♦ **<<W.u.LoAd>> WAIT TIME FOR UNLOADING END (sec.)**

For btC.1-L and bAtCh modes: wait time for ending the unloading from when the value of the weight on the scale reaches the UNLOADING END THRESHOLD (**<<End.unL>>** parameter); the unloading relay, during this time period, remains active.

For btC.1-u mode: wait time for ending the silo reloading from when the of the weight on the scale reaches the REFILL END THRESHOLD (**<<End.Ld>>** parameter).

Programmed at 0, it has no effect.

NOTE: t min= 0000.00 sec ; t max= 9999.99 sec

(!) 0000.00

♦ **<<rEAd.W>> MAXIMUM DATA READING WAIT TIME (sec.)**

The instrument waits for this time before passing to the following phase in order to allow the reading of the data relative to the phase made.

The function is enabled after the possible tolerance test at the end of the activity (both load and unload)

Programmed at 0, it has no effect.

NOTE: t min= 0000.00 sec ; t max= 9999.99 sec

(!) 0000.00

♦ **<<t.d.MAn>> WAIT TIME FOR MANUAL DOSAGE END (sec.)**

Only for manual dosages in loading

Waiting time during the loading activity which goes from the reaching of the target and the automatic end of a manual phase.

If the weight is greater than the target (and the tolerance test is disabled) or within the tolerance (and the tolerance test is enabled) and:

t.d.MAn = 0	the function is disabled: the manual dosage is ended only by giving a start command. For weight values different from the previous ones, it's necessary to give a start command after the "SurE?" confirmation request.
0 < t.d.MAn < 9999.99	the manual dosage can be ended by giving a start command or **<<t.d.MAn>>** seconds after the target achievement. For weight values different from the previous ones, it's necessary to give a start command after the "SurE?" confirmation request.
t.d.MAn = 9999.99	the function is disabled: the manual dosage is ended only by giving a start command and only for the previous weight values.

NOTE: t min= 0.00 sec ; t max= 9999.99 sec

(!) 0000.00

- **<<VW.MSG>> TIME OF VISUALIZATION OF THE SECONDARIES MESSAGES (sec.)**

  During the dosage cycle, the display shows additional messages to the standard ones, for the time set in this step.
  Programmed at 0, it has no effect.
  NOTE: t min= 0.00 sec ; t max= 2.00 sec

(!) 0000.00

- **<<r.toL.tM>> TOLERANCE OUTPUTS ACTIVATION TIME (sec.) (§)**

  Only for btC.1.L and btC.1.u mode

  At the end of a dosage, the outputs OK.DOS, TOL.ERR, ERROR are active, in order to indicate the result of the performed dosage, for the time set in this step.
  Programmed at 0, it has no effect.
  NOTE: t min= 0.00 sec ; t max= 9999.99 sec

(!) 0001.00

(§) The parameter is displayed only if the tolerance test is enabled.

- **<<d.CY.on>> TIME OF AN "ON" PHASE INT THE SLOW OPERATION SPEED MODE (sec.)**

  Only for btC.1.L (automatic dosage) and btC.1.u mode

  When the target weight minus the slow weight and the flight weight is reached, the R1 fine dosage output can be opened and closed according to the "on" phase set in this step (TAPPING), until the flight weight is reached.
  By setting a value equal to 0 the tapping function is disabled.
  NOTE: d.CY.on min= 0.00 sec ; d.CY.on max= 2.50 sec

(!) 0.00

- **<<d.CY.oFF>> TIME OF AN "OFF" PHASE INT THE SLOW OPERATION SPEED MODE (sec.)**

  Only for btC.1.L (automatic dosage) and btC.1.u mode

  When the target weight minus the slow weight and the flight weight is reached, the R1 fine dosage output can be opened and closed according to the "off" phase set in this step (TAPPING), until the flight weight is reached.
  By setting a value equal to 0 the tapping function is disabled.
  NOTE: d.CY.oFF min= 0.00 sec ; d.CY.oFF max= 2.50 sec

(!) 0.00

▪ <<PWd.doS>> SETTING ACCESS PASSWORD

One configures whether to enable or disable the access password to the phases and formulas databases and to the F.ModE and SEtuP submenus of the setup environment; therefore it will be possible to access only in the instrument's diagnostics menu.

<<EnAbLE>>: password ENABLED;
<<diSAbL>>: password DISABLED.

By selecting **<<EnAbLE>>**, the instrument predisposes itself for the password entry, made up of up to 5 digits (min.00000, max. 65534); when finished entering confirm with **PRINT**.

Before accessing the menu, the "uSEr" message will appear for a few instants. Once entered with the password, one access the complete menu by pressing the **TARE** key while the message "uSEr" is being displayed. A numeric value (the numeric value changes with each access) will appear, which is to be substituted with the known password.
If the password is correct, the instrument shows "tECh" and one accesses the complete menu.
If the password is not correct, the instrument shows "uSEr" and one accesses the reduced menu.
The password remains active until it is substituted or disabled.

(!) diSAbL

- **<<outPut>> SETTING THE RELè FUNCTIONING**

  By pressing **ENTER** one accesses the menu for the relay selection

  rEL.1 ÷ 6 Output number (relay)

  It's possible to link a specific function to each relay:

  nonE DISABLED output
  toL.Min Output enabled when the weight is below the lower tolerance
  toL.PLu Output enabled when the weight is above the upper tolerance
  toL.Err Output enabled when the weight is below the lower tolerance and above the upper tolerance
  ok.doS Output enabled when the dosage appears to be correct
  un.LoAd Output enabled for the discharge phase (**btC.1-L** mode) or charge phase (**btC.1-u** mode)
  Error Output enabled when an error takes place
  FASt Output enabled when a quick dosage is being executed
  doS.End Output enabled when the dosage is finished
  doSAGE Output enabled for the dosage in the **btC.1-u** and **btC.1-L** modes linkable to a component in the **bAtCh** mode

  (!) bAtCh mode:

rEL.1	**doS.End**
rEL.2	**doSAGE**
rEL.3	**doSAGE**
rEL.4	**doSAGE**
rEL.5	**doSAGE**
rEL.6	**doSAGE**

  btC.1-L and btC.1-u mode

rEL.1	**doSAGE**
rEL.2	**FASt**
rEL.3	**un.LoAd**
rEL.4	**ok.doS**
rEL5	**toL.Err**
rEL6	**Error**

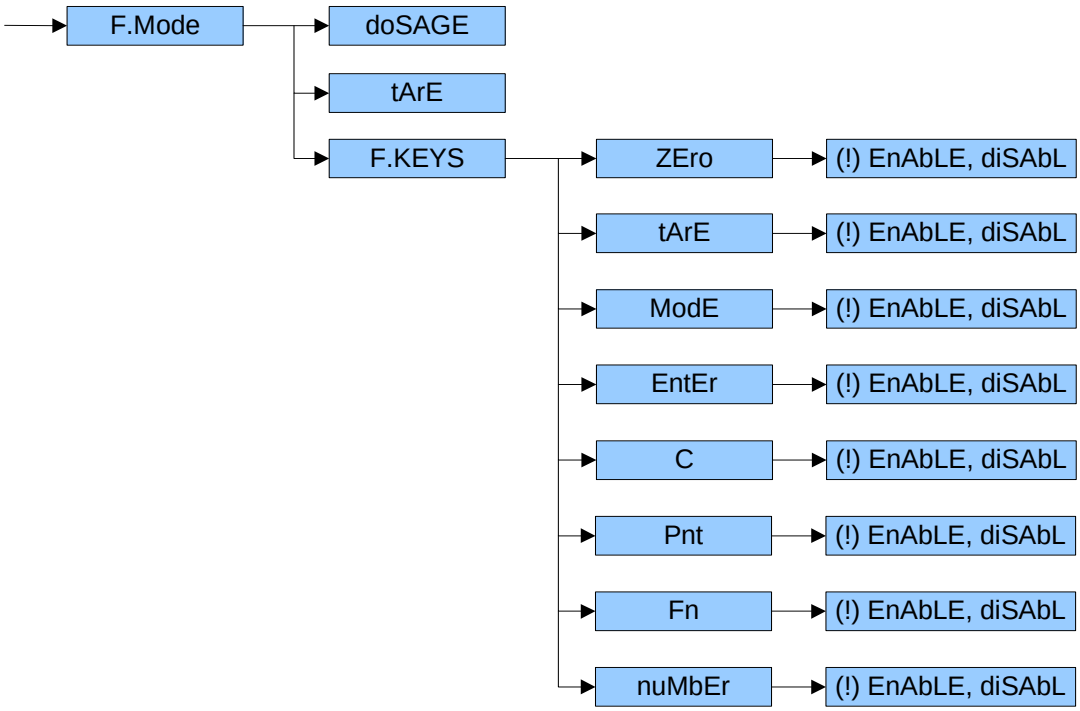
➢ tArE LOCKED / UNLOCKED / DISABLED TARE SELECTION

<<unloCK>>> **UNLOCKED TARE**
<<LoCK>> **LOCKED TARE**
<<diSAb>> **DISABLED TARE**

See the "7.2.4 LOCKED/UNLOCKED/DISABLED TARE" section for further functioning details, **USER MAN. REF.**

(!) LoCK

➢ F.KEYS ENABLE/DISABLE KEYS



<<Zero>>
- **EnAbLE** ZERO KEY ENABLED
- **diSAbL** ZERO KEY DISABLED

<<tArE>>
- **EnAbLE** TARE KEY ENABLED
- **diSAbL** TARE KEY DISABLED

<<ModE>>
- **EnAbLE** MODE KEY ENABLED
- **diSAbL** MODE KEY DISABLED

<<EntEr>>
- **EnAbLE** ENTER/PRINT KEY ENABLED
- **diSAbL** ENTER/PRINT KEY DISABLED

<<C>>
- **EnAbLE** C KEY ENABLED
- **diSAbL** C KEY DISABLED

<<Pnt>>
- **EnAbLE** POINT KEY ENABLED
- **diSAbL** POINT KEY DISABLED

<<Fn>>
- **EnAbLE** F1, F2, F3, F4 KEYS ENABLED
- **diSAbL** F1, F2, F3, F4 KEYS DISABLED

<<nuMbEr>>
- **EnAbLE** NUMERIC KEYS ENABLED
- **diSAbL** NUMERIC KEYS DISABLED

<<SEtuP>> SCALE CONFIGURATION

➢ <<ConFiG>> METRIC CONFIGURATION

▪ <<PArAM>> METRIC PARAMETERS

♦ **(*) <<StAbiL>> FILTER INTEGRATION**

By pressing the **PRINT** key one accesses the selection of the type and degree of filter intervention for the stability of the weight indication:

FLt 0 ÷ 3	filter for simple weighing
dYn.0 ÷ 3	filter for crane scale
h.r.0 ÷ 7	filter for high resolution
F.F.50.1 ÷ 3	filter for dosage at 50 Hz
F.F.100.1 ÷ 4	filter for dosage at 100 Hz
F.F.200.1 ÷ 3	filter for dosage at 200 Hz

Higher is the filter value, and greater is its intervention relative to the type of filter used.

(*) with APPROVED instrument, one can select only the **FLt 0**, **FLt 1**, **FLt 2**, **FLt 3**, **h.r.0**, **h.r.1**, **dyn.0**, **dyn.1** parameters.

(!) FIt 3

♦ **(*) <<Auto-0>> AUTO ZERO AT THE START-UP**

Automatic acquisition of the gross zero at the start-up (up to +/- 10% of the capacity):
EnAb: Enabled.
diSAb: Disabled.

(*) with APPROVED instrument the parameter is read-only.

(!) diSAb

♦ **(*) <<0.trACk>> ZERO TRACKING**

This menu allows to set the zero tracking, in other words, the compensation parameter of the scale's thermal drift; the set value corresponds to the number of divisions that is reset in the fixed time of 1 second.

tr. ½	+/- half division.
tr. ¼	+/- one fourth of a division.
tr. 1	+/- one division.
tr. 2	+/- two divisions.
tr. no	tracking disabled.

(*) with APPROVED instrument, one can select only the **tr. no**, **tr. ½** , **tr. ¼** parameters.

(!) tr. ½

♦ **(*) <<diV.Stb>> DIVISIONS FOR STABILITY**

In this step one enters the number of divisions by which the instrument detects the weight stability; the higher the number of divisions, less is the sensitivity, and consequently the stability is more easily detected. The possible values are 0 (weight always stable)…99.

(*) with APPROVED instrument the parameter is read-only.

(!) 02

- (*) **<<GrAV>> GRAVITY ACCELERATION AND OF USE**

  Through this step one selects the acceleration value **of calibration and of use** of the instrument:
  Manual entry of the g value: one may manually enter the gravitational acceleration value;
  In case one enters a wrong g value: the minimum decimal value is suggested (9.75001); a wrong value is any decimal number that is not between 9.75001 and 9.84999 (inclusive).

  (*) wit APPROVED instrument the parameter is read-only.

  (!) 9.80655

- (*) **<<CALib.>> SCALE CALIBRATION**

  See the "4.1 CALIBRATION PROCEDURE" section.
  (*) with APPROVED instrument the parameter is read-only.

- (*) **<<0.CALib.>> ZERO CALIBRATION**

  See the "4.1 CALIBRATION PROCEDURE" section.
  (*)The parameter is not displayed if the instrument is APPROVED.

- **<<An.out>> ANALOGUE OUTPUT**
  Only for DGTPKFAN model

  - **SLot SLOT SELECTION**
    One selects the SLOT to be used with the analogue output: SLOT 1 or SLOT2.

  - **ModE OPERATING MODE**
    AO no = analogue output disabled.
    AO Gro = analogue output on the gross weight.
    AO nEt = analogue output on the net weight.
    dos.VAL = analogue output proportional to the weight of the single component of the dosage.
    dos.Spd = analogue output proportional to the dosage speed: the instrument asks to enter the (target – flight) weight percentage when the slow part of the dosage is reached and the voltage/current output decreases its value.

  - **Ao MAX MAXIMUM VALUE**
    Setting of the maximum value of the analogue output.

  - **Ao ZEr SCALE ZERO VALUE**
    Setting of the analogue output value when the scale displays zero weight.

  - **Ao Min MINIMUM VALUE**
    Setting of the minimum value of the analogue output.

  See the "ANALOGUE OUTPUT" for configuring it.

➢ <<dSP.rf>> DISPLAY REFRESH

It is possible to slow the speed of the display refresh improving the stability of the displayed data:
- **norM**. The function of improving the stability of the displayed data is disabled
- **20Hz** 20 display / sec refreshments
- **10Hz** 10 display / sec refreshments
- **5Hz** 5 display / sec refreshments
- **2.5Hz** 2,5 display / sec refreshments
- **1Hz** 1 display / sec refreshments

NOTE: This works only the displaying.

(!) norM.

➢ <<SeriAL>> SELECTION OF SERIAL OUTPUT PARAMETERS

▪ <<PC SEL>> PC SERIAL SELECTION

Through this step one can select the PC serial port and therefore invert the serial ports.

COM1 The communication between the indicator and the PC takes place through the **COM1** serial port while the transmission of the data to the printer takes place through the **COM2** serial port.

COM2 The communication between the indicator and the PC takes place through the **COM2** serial port while the transmission of the data to the printer takes place through the **COM1** serial port.

(!) COM2

▪ <<CoM.Prn>> PRINTER SERIAL PORT

♦ <<Pr.ModE>> TRANSMISSION UPON PRINTER SERIAL

Pr-no transmission disabled.
tPr enables the printing with ASCII printer (for example, DP190 or TPR).
ALL.Std continuous transmission with standard string.
rEPE.6 transmission to 6-digit remote display.
rEP.Ext continuous transmission with extended repeater string.

NOTES:
- By selecting the REPE.6 or rEP.Ext protocols, the serial output is automatically set at 4800, n-8-1.
- For the protocol and transmission mode specifications, see the "8.3 SERIAL PORT TRANSMISSION MODES" and "8.5 TRANSMISSION PROTOCOLS" sections.

(!) Pr-no

♦ <<bAud.Pr>> IMPOSTAZIONE BAUD RATE

By pressing the **PRINT** key one accesses the selection of the data transmission speed (measured in Baud = bit/second). The possible values are:
1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200.

(!) 9600

♦ <<bit.Pr>> SET PARITY, WORD, STOP BIT

By pressing the **PRINT** key one accesses the selection of the available values:
n-8-1, n-8-2, n-7-2, E-7-1, E-7-2.

(!) n-8-1

♦ <<PWr.Prn>> SETTING PRINTER MANAGEMENT

In this step one programmes the management of a possible connected printer:

PwrEXt with instrument on, printer managed.
EXtoFF printer managed; the start-up characters are sent to the printer, because the printer is considered to be configured in the energy saving mode.

(!) PWrEXt

♦ <<Prn.CtS>> RTS/CTS STATUS CONFIGURATION (§)

On the printer serial line the indicator has a CTS input (Clear To Send). A device (like a printer) that is slow in processing the received data, can interrupt the transmission temporarily using this signal.

- **noCtS** No signal
- **CtSL** CTS active low (for TPR printer)
- **CtSh** CTS active high (for DP190 printer)
- **EmuCtS** Emulation of the CTS signal: one is asked to enter the number of characters (nChrS), in 3 digits, which will be transmitted to the printer upon each transmission; then one needs to enter the waiting time in milliseconds (tiME), in 4 digits, between a transmission and another.

The TIME OUT of a printout is a minute, in other words, after a minute that the printout is blocked, it is cancelled.

(!) noCtS

(§) The parameter is not displayed unless "tPr" has been selected in the "PrModE" step.

♦ **<<End.PAG>> SELECTION OF END PAGE PRINTING**

This step allows to print 2 empty lines at the end of each printout (if "tPr" is selected in the "Pr.ModE" step).

diSAbL	does not print the page end.
ALWAyS	prints the end page at the end both of every dosage cycle of every report and of every simple printout
rEPort	prints the end page just at the end of a report.
doSAGE	prints the end page just at the end of a dosage cycle and of every simple printout.

(!) diSAbL

♦ **<<LAnG>> SELECTION OF PRINT LANGUAGE**

This step allows to set the language with which the printing are made.

itAL	Italian language.
EnGL	English language.
dEut	German language.
FrAn	French language.
ESPA	Spanish language.

(!) itAL

♦ **<<dAtE.tM>> PRINTS DATE AND TIME**

<<EnAbLE>>	the date and time are printed
<<diSAbL>>	the date and time are not printed

(!)EnAbLE

▪ <<CoM PC>> PC SERIAL

♦ **<<PC ModE>> TRANSMISSION ON THE PC SERIAL**

ondE	transmission on external command (given from PC or PLC, for example).
485	transmission with 485 protocol. By confirming with **PRINT**, one is required to enter the machine code (the message "Ad485" appears for an instant): enter a value between 0 and 98.
ALL.Std	continuous transmission with standard string.
rEPE.6	transmission to 6 digit remote display.
rEP.EXt	continuous transmission with multi repeater string .

NOTES:

- By selecting the rEPE.6 or Rep.EXT protocol the serial output is automatically set at 4800, n-8-1.
- For the transmission modes and protocol specifications, see the 8.3 "SERIAL PORTS TRANSMISSION MODES" and 8.5 "TRANSMISSION PROTOCOLS" sections.

(!) ondE

♦ **<<bAud>> SET BAUD RATE**

By pressing the **PRINT** key one accesses the selection of the data transmission speed (measured in Baud = bit/second). The possible values are:
1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200

(!) 9600

♦ **<<bit>> SET PARITY, WORD, STOP BIT**

By pressing the **PRINT** key one accesses the selection of the available values:
n-8-1, n-8-2, n-7-2, E-7-1, E-7-2

(!) n-8-1

- **<<tErM>> SET TERMINATOR TYPE**

  When connecting a printer to the indicator, it's often necessary to transmit one of the following characters in order to define the end of the print line.

  Cr CR
  LF LF
  Cr LF CR LF
  no.tErM no terminator

  Note: for the TPR printer, it's necessary to set the LF terminator.

  (!) LF

➢ <<dEFAu>> INITIALIZATION OF THE INSTRUMENT (§)

Through this step one can initialize the instrument with the subsequent activation of the default parameters. By pressing **PRINT**, a confirmation message ("dFLt?") will appear: confirm again with **PRINT** or exit with any other key. After the confirmation, for an instant "E2.init" is displayed to indicate the EPROM initializing

NOTE: The initialization of the instrument causes a cancellation of the present calibration and the activation of the default parameters. In any case if one exits the setup environment WITHOUT CONFIRMING the modification made, all the parameters of the last saving made will remain (including the calibration).

(§) In case of approved instrument, the default DOES NOT HAVE EFFECT on the metrological parameters (those marked with (*)).

<<diAG>> DIAGNOSTIC MENU

It is a submenu inside which it is possible to check the software components and the scale hardware.

➢ PrG.VEr. CHECKING THE SOFTWARE VERSION

By pressing **PRINT** the instrument shows the software version in the XX.YY.ZZ. format.

➢ diV.int CALIBRATION INTERNAL DIVISIONS

By pressing **PRINT** the instrument shows the calibration internal divisions.

➢ AdC.uV MILLIVOLTS

By pressing **PRINT** the instrument shows the millivolts relative to the weight on the scale.

➢ AdC.Pnt PUNTI CONVERTITORE

By pressing **PRINT** the instrument shows the A/D converter points relative to the weight on the scale.

➢ diSPLA DISPLAY TEST

By pressing **PRINT** the instrument turns on all the display segments one at a time, then automatically it exits from the step.

➢ KEYb. KEYBOARD TEST

By pressing **PRINT** the instrument displays 0000; by pressing the keys one at a time, the relative codes are brought again to the display. One exits pressing the same key three times.

➢ SEr RS232 SERIAL PORT TEST

By pressing **PRINT** the instrument displays "S xy" in which x indicates the status of the printer serial port while y indicates the status of the PC serial port. Both can take on two values:

0 Serial port does not work
1 Serial port works

During the test one should short-circuit A(+) with B(-) (in the COM1 terminal) and TX with RX (in the COM2 terminal).Furthermore the ASCII "TEST"<CRLF> string is continuously transmitted on both the serial lines.
CAREFUL: It's not possible to test the functioning of the COM1 port if configured like RS485.

- **CtS.St.** TEST OF CTS STATUS

  By pressing **PRINT** one views the status/level of the CTS signal of the printer (on) connected to the printer serial port.

- **outPut** TEST OF THE OUTPUTS

  By pressing **PRINT** the instrument displays **"rEL.01"** and enables output 1; press the **ZERO** or **TARE** key to enable the other output.

- **inPutS** TEST OF THE INPUTS

  By pressing **PRINT** the instrument displays " **i.x-y** " in which x and y indicate:
  x is the input which is controlling 1 and 2; to change the input which one wants to control press the **ZERO** or **TARE** keys.
  y is the input status:
  0 Disabled input.
  1 Enabled input.

- **An out** ANALOGUE OUTPUT TEST

  Not used in this application

- **SEr.nuM** SERIAL NUMBER

  Diagnostic check for use of the manufacturer.

4. CALIBRATION

4.1 CALIBRATION PROCEDURE

1) Enter in the SETUP ENVIRONMENT of the scale (when turned on, press for an instant the **TARE** key while the firmware version is displayed).

2) Select the step **SEtuP >> ConFiG >> CALib** and press **PRINT**.

3) ***Setting Total Capacity or 1st Range***
Select the "rAnGE1" step and press **PRINT**;
Set the total capacity of the scale or the first range in case of multirange functioning.
The keys take on the following functionalities:

ZERO	Decreases the selected digit (blinking).
TARE	Increases the selected digit (blinking).
MODE	Selects the digit to be modified (blinking), from left to right.
C-ON/Stb	Quickly zeros the displayed value.

4) ***Setting of the 2nd Range capacity***
Select the "rAnGE2" step (only in case of dual range scale) and press **PRINT**;
Set the capacity of the second range and press **PRINT**.

5) ***Minimum Division***
Select the "diV" step and press **PRINT**;
Set the scale's minimum division or the first range in case of dual range and press **PRINT** (selectable values: 1, 2, 5, 10, 20, 50).
(!) 1

6) ***Number of Decimal digits***
Select the "dECi" step and press **PRINT**;
The selectable values are 1.0 (one decimal), 1.00 (two decimals), 1.000 (three decimals), 100000 (no decimal); confirm with **PRINT**.
(!) 1.000

7) ***Unit of Measure***
Select the "u.M." step and press **PRINT**.
Set the unit of measure (g, Lb, t, kg) and press **PRINT**.
(!) kg

8) Select the "CALib.P" step and press **PRINT**.

9) Select the "n tP" step and press **PRINT**.

10) ***Nr. of Calibration points***
Set the number of points with the **ZERO** or **TARE** keys on which one wants to make the calibration (from 1 to 3, with 1 one will make the zero point and a weight point) and press **PRINT**.

11) ***Acquisition of Scale Zero***
Select the "tP0" step (scale zero point): unload the scale and wait a few seconds; then press **PRINT**.

12) ***Setting of 1st Sample Weight***
Select the "ddt1" step (setting of first sample weight); press **PRINT**, enter the weight value and confirm with **PRINT**.

13) ***Acquisition of 1st Sample Weight***
Select the "tP1" step (acquisition of first sample weight): put the weight on the scale, wait a few seconds and press **PRINT**.

14) **<u>If a calibration point had been set</u>**, once the weight acquisition has been made, the display shows for an instant the value of the internal divisions and then the "ntP" step.

15) **<u>If there are more calibration points</u>, repeat the operations for the points "ddt2", "tP2", "ddt3", "tP3"**. Once the weight acquisition is made, the display shows for an instant the value of the internal divisions and then the "ntP" step.

16) ***Saving the Calibration***
Once the calibration has been made of all the necessary points, press many times the **C - ON/Stb** key until the indicator shows "SAVE? " in the display: confirm with **PRINT** to store and return to weighing.

N.B.: the calibration points must be in increasing order (point 1 < point 2 < point 3).

4.2 ACQUISITION OF A SINGLE CALIBRATION POINT WITH THE SCALE ALREADY CALIBRATED

This procedure is useful when the scale weighs not correctly and one wants acquire only a single calibration point without execute a new complete calibration.

1) Enter in the SETUP ENVIRONMENT of the scale (when turned on, press for an instant the **TARE** key while the firmware version is displayed).
2) Select the step **SEtuP >> ConFiG >> CALib >> CALib.P** and press **PRINT**.
3) Select and set the sample weight that one wants acquire (ddt1…ddt3) and then select the calibration point that one wants acquire (tP 1….tP 3) and press **PRINT:** the “Get.Wt?” message appears.
4) Put the weight on the scale, wait a few seconds and press **PRINT**.
5) once the weight acquisition has been made, the display shows for an instant the value of the internal divisions and then the "ntP" step.
6) Press many times the **C - ON/Stb** key until the indicator shows "SAVE? " in the display: confirm with **PRINT** to store and return to weighing.

4.3 THEORETICAL CALIBRATION

Premise: it's possible to use this procedure if one does not have a sample weight available for carrying out a real calibration.

7) Follow the steps described in par. **4.1** up to point 7)
8) Select the "thEo.CA" step and press **PRINT**
9) **Setting cell sensitivity in mV/V**
   Select the "CEL.SEn" step; press **PRINT**, enter the cell sensitivity in mV/V (up to 99.99999 mV/V) and confirm with **PRINT**.
   In case of various connected cells through the junction box, enter the average of the value; in case of dependent channels, enter the sum of the value.
10) **Setting cell capacity**
    Select the "CEL.CAP" step; press **PRINT**, enter the cell capacity (the unit of measure is the one configured for the scale, up to 999999) and confirm with **PRINT.**
    In case of various connected cells, enter the sum of the capacities.
11) **Setting pre-load weight**
    Select the "dEAd.Ld" step; press **PRINT**, enter the weight of the structure bearing on the load cells.
    The first character indicates the sign: '0' indicates a positive value, '-' indicates a negative value.
    The sign is changed by positioning on the first digit and press on the up arrow / down arrow keys:
    with 3 decimals: from -9.9999 to +9.9999
    with 2 decimals: from -99.999 to +99.999
    with 1 decimal: from -999.99 to +999.99
    with 0 decimals: from -9999.9 to +9999.9
    Confirm with the **PRINT** key.
    Note: enter 000000 if one does not know this value.
12) **Acquisition of a known weight**
    Select the "Kno.WGt" step and press **PRINT**; the "GET.WT?" message appears; enter the known value (value included between 0 and the scale capacity, the unit of measure is the one set for the scale) and press **PRINT**.
    Note: by setting 0 one acquires the weight of the bearing structure on the cells.

    In case of unstable weight the "ER.MOT" message will appear for a second, and one will be asked if one wants save the value ("StorE?" message):
    - press the **PRINT** key to capture the value.
    - press the **C** key to repeat the acquisition of the weight ("rEtrY?" message). Press **PRINT** to confirm, or **C** to cancel.

Once the procedure is finished, press the **C** key to exit the calibration; one will be asked whether to apply the new calibration ("th.CAL?"). Press **PRINT** to confirm, or **C** to cancel.
Note: once the calibration is confirmed, the indicator sets the capacity of the cells ("CEL.CAP" step) equal to the scale capacity; consequently the values of the other steps are automatically recalculated.

Example 1:
one wants calibrate a system with 4 load cells connected through the junction box. The characteristics of every load cell are:
Load cell 1 : 1.99987mV/V, 300kg
Load cell 2 : 1.99993mV/V, 300kg
Load cell 3 : 1.99986mV/V, 300kg
Load cell 4 : 1.99994mV/V, 300kg
In the <<CEL.SEn>> step enter 1.99990 (the average of all signals).
In the <<CEL.CAP>> step enter 1200 (the sum of all capacities).

Example 2:
one wants calibrate a system with 4 load cells directly connected to the board of the indicator. The characteristics of every load cell are:
Load cell 1 : 1.99987mV/V, 300kg
Load cell 2 : 1.99993mV/V, 300kg
Load cell 3 : 1.99986mV/V, 300kg
Load cell 4 : 1.99994mV/V, 300kg
In the <<CEL.SEn>> step enter the sum of all signals : 7.9996 .
The same thing is for the <<CEL.CAP>> step that will be 1200 (the sum of all capacities).

4.4 MODIFYING A CALIBRATION ZONE IF DIFFERENT FROM THE ZONE OF USE

In case the zone of use is different from the calibration zone one should:

1) Enter the SETUP ENVIRONMENT of the scale (when turned on, press for an instant the **TARE** key while the firmware version is displayed).
2) Enter the step **SEtuP >> ConFiG >> GrAV.** and set the gravity acceleration value for the CALIBRATION ZONE.
3) Make the calibration as described previously.
4) Save and exit the SETUP ENVIRONMENT (press various times the **C - ON/Stb** key until the indicator shows "SAVE?" in the display and confirm with **PRINT**.
5) Enter the SETUP ENVIRONMENT of the scale and enter the step **SEtuP >> ConFiG >> GrAV.** and set the gravity acceleration value for the ZONE OF USE.
6) Save and exit from the SETUP ENVIRONMENT.
7) The weight error caused by a different gravitational value between the calibration zone and the zone of use is automatically corrected.

4.5 QUICK CALIBRATION OF ZERO

Useful for calibrating just the ZERO point when a permanent TARE weight is added to the scale.

1) Enter in the SETUP ENVIRONMENT of the scale (upon start-up, press for an instant the **TARE** key while the firmware version is displayed).
2) Enter the step **SEtuP >> ConFiG >> 0.CALib** and press **PRINT** (the display shows "CAL.0?").
3) ***Tare Acquisition***
   Put the tare on the scale and press **PRINT** to confirm the operation.
4) ***Saving the Calibration***
   Once the zero calibration is made, press various times the **C - ON/Stb** key until the indicator shows "SAVE?" in the display: confirm with **PRINT** to store and return to weighing.

5. DESCRIPTION OF INPUTS

INPUT	FUNCTION	DESCRIPTION
IN 1	**DOSAGE START**	Causes dosage to start / exits the error and pause statuses.
IN 2	**RESET/PAUSE**	- When present, it causes the dosage to pause. - Another pulse in pause state interrupts and cancels the dosage under way and it waits for the start impulse for the following dosage.
IN 3 / IN 4	**SELECT FORMULA**	See the **<<For.SEL.>>** step.

6. DESCRIPTION OF OUTPUTS

6.1 "MULTICOMPONENT DOSAGE" FUNCTIONING MODE

RELAY	FUNCTION (DEFAULT)	DESCRIPTION
RL 1	**DOSAGE CYCLE END**	Indicates that the dosage under way is done (formula end relay).
RL 2 … RL 6	**PRODUCT OUTPUTS**	It is possible to link each of these outputs to each single dosage phase.

6.2 "SINGLE-COMPONENT DOSAGE IN LOADING" FUNCTIONING MODE

RELAY	FUNCTION (DEFAULT)	DESCRIPTION
RL 1	PRODUCT OUTPUT	Output linked to the product
RL 2	SPEED	Active at the maximum dosage speed.
RL 3	UNLOADING	Active for signaling the product unloading.
RL 4	CORRECT DOSAGE	Output enabled when the dosage appears to be correct
RL 5	OUT OF TOLERANCE	Active when the dosage weight is out of tolerance.
RL 6	ERROR	Active each time that an error condition is created.

6.3 "SINGLE-COMPONENT DOSAGE IN UNLOADING" FUNCTIONING MODE

RELAY	FUNCTION (DEFAULT)	DESCRIPTION
RL 1	PRODUCT OUTPUT	Output linked to the product
RL 2	SPEED	Active at the maximum dosage speed.
RL 3	REFILL	Active for signaling the product refill.
RL 4	CORRECT DOSAGE	Output enabled when the dosage appears to be correct
RL 5	OUT OF TOLERANCE	Active when the dosage weight is out of tolerance.
RL 6	ERROR	Active each time that an error condition is created.

7. GRAVITY ACCELERATION AND CORRECTION OF THE WEIGHING ERROR

7.1 INDICATION OF THE GRAVITY ACCELERATION VALUE (Compulsory for the legal type instruments)

This instrument conforms to the laws currently in force regarding non-automatic weighing instruments.
Such g-sensitive instruments are influenced by the "**g**" gravitational acceleration value of the utilisation zone hence it is compulsory to indicate, with a label or on the display, the coded name of the utilisation zone where the weighing machine can be used.
By pressing the **ZERO** key when turned on, the instrument display, after the name and the installed software version, the gravity acceleration value of the zone of use for a few seconds. Specifically:

Approved instrument:
Instrument start-up → … → "**LEGAL**" or "**hi rES**" → "***g value*** "

7.2 CORRECTION OF THE WEIGHING ERROR INTRODUCED BY A DIFFERENT G VALUE BETWEEN THE CALIBRATION AND UTILISATION ZONE (Compulsory for legal type instruments).

Since it's a g-sensitive instrument, a special program has been created to compensate for any difference in the "**g**" gravitational attraction between the place where the scale is calibrated and where it is used, and in this way eliminating the error on the weight.

Approved instrument:
In the SETUP ENVIRONMENT, in the **SEtuP >> ConFiG >> GrAV.** step it's possible to only have displayed the gravitation acceleration value of the destination zone of use.

Not approved instrument:
In the SETUP ENVIRONMENT, in the **SEtuP >> ConFiG >> GrAV.**, step it's possible to view and/or enter the gravitation acceleration value of the destination zone of use.

8. SERIAL OUTPUTS

The instrument has two bidirectional serial outputs, which have the output in ASCII code compatible with the majority of printers, remote displays, PCs and other devices.
The transmission of data through the serial ports can be configured in different ways, according to the setting of the "PC SEL", "PCMode**"** and "Pr.ModE" steps in the SETUP environment.
Refer to the 7.3 section for the functioning specifics.

8.1 COM1 SERIAL PORT

It is bi-directional (full duplex) and uses an RS232/485 for transmitting data.
It is mainly used to connect computers, PLCs, additional remote displays.
The transmission speed may be selected in the SET UP among these: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 Baud (bit/sec.).
Below is the RS485 connection of the indicator:

INDICATOR	MEANING
25 B(-)	Line 485 -
24 A(+)	Line 485 +

Connections in RS232 from LP542S, DP24, DP190 printer to the COM1 serial port:

	DP24/LP542S 9pin (female)	DP190 Terminal Board	INDICATOR	STANDARD CABLE
GND	5	GND	28 GND	Grey
CTS	8	BU	27 RX1	Brown
RX	3	RX	26 TX1	Pink

Please find below the connection in RS232 between the TPR printer and the COM1 serial port:

TPR	INDICATOR	STANDARD CABLE
GND	28 GND	Grey
RTS	27 RX1	Brown
RX	26 TX1	Pink
Blue (not connected)		

Below is the connection in RS232 between the PC and the COM1 serial port:

	PC 9pin (male)	PC 25pin (male)	INDICATOR	STANDARD CABLE
GND	5	7	28 GND	Grey
TX	3	2	27 RX1	Yellow
RX	2	3	26 TX1	Pink

8.2 COM2 SERIAL PORT

It is bi-directional (full duplex) and uses an RS232 for transmitting data; it is mainly used to connect to printers, computers and PLCs. The transmission speed may be selected in the SETUP among these: 1200, 2400, 4800, 9600, 19200, 38400, 57600,115200 Baud.

Connections from DP24, DP190 printer to indicator:

	DP24 9pin (female)	DP190 Terminal Board	INDICATOR	STANDARD CABLE
GND	5	GND	32 GND	Grey
CTS	8	BU	31 CTS2	Brown
RX	3	RX	29 TX2	Pink

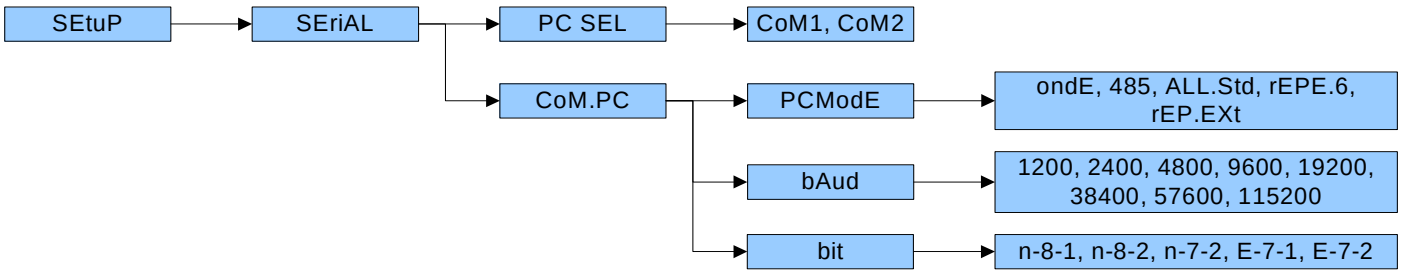
Please find below the connection between the TPR printer and the indicator:

TPR	INDICATOR	STANDARD CABLE
GND	32 GND	Black
RTS	31 CTS2	Yellow
RX	29 TX2	Grey
Blue (not connected)		

Below is the connection in RS232 between the PC and the indicator:

	PC 9pin (male)	PC 25pin (male)	INDICATOR	STANDARD CABLE
GND	5	7	32 GND	Grey
TX	3	2	30 RX2	Yellow
RX	2	3	29 TX2	Pink

8.3 SERIAL PORT TRANSMISSION MODES



8.3.1 PC PORT SELECTION

It's possible to select the serial port to be used as a PC port and therefore invert the serial ports.
This setting is made in the **SEtuP** >> **SEriAL** >> **PC SEL** step of the SETUP environment.

By selecting the **COM 1** serial port as PC PORT, the **COM 2** serial line is set as PRINTER PORT.
By selecting the **COM 2** serial port as PC PORT, the **COM 1** serial line is set as PRINTER PORT.

8.3.2 PC PORT

Please find below the various selectable serial weight transmission modes of the PC serial port through the corresponding "PCModE" step of the SETUP environment.

- **TRANSMISSION REQUESTED FROM AN EXTERNAL DEVICE** ("ondE" parameter)
  In this case the indicator waits for a command before transmitting (see the "8.4 SERIAL COMMANDS FORMAT" section).
  With Baud rate at 9600, through the READ command, it is possible to make up to 10-11 requests per second, while with Baud rate at 115200 one can arrive at 16.
  The transmission works with weight <, =, > 0 with approved or unapproved instrument.

- **TRANSMISSION IN RS 485 SERIAL MODE** ("485" parameter)
  The protocol is the same as the transmission upon request (ondE parameter), except that the instrument responds only if its machine code is the one requested (before the request the machine code must be put, i.e. 00READ<CRLF>).
  If a broadcast address command (99) is received no answer is given. If the command is correct it is executed anyways.

- **CONTINUOUS TRANSMISSION** ("ALL.Std" parameter)
  This mode is used for interfacing to the PC, remote displays and other devices which request a constant updating of the data independently from the weight stability.
  The instrument transmits data with each converter read operation:
  - With Baud rate at 9600 one can obtain up to 10 transmissions per second.
  - With Baud rate at 115200 one can obtain up to 16 transmissions per second for the PC port, 12 for the PRINTER port.
  The transmission works with weight <, =, > 0 with approved or unapproved instrument.
  The data is transmitted using the standard string (ALL.Std) (see the "8.5 TRANSMISSION PROTOCOLS" section).

- **6 DIGIT REMOTE DISPLAY TRANSMISSION** ("rEPE.6" parameter)
  In this case the weight displaying takes place both in the indicator as well as in a weight repeater of 6 digits, (normally the capacity will be properly set up for a correct displaying).
  NOTE: When this transmission mode is selected, the relative serial output is automatically set to 4800, N – 8 – 1 . In any case it's possible to set it differently.
  Independently from the set transmission speed one can obtain up to 6 transmissions per second.

- **MULTI REPEATER STRING TRANSMISSION** ("rEP.EXt" repeater)
  In this case one can configure up to four weight repeaters so that each one displays different information.
  The data is transmitted using the multi repeater string (rEP.EXt) (see the "8.5 RANSMISSION PROTOCOLS" section).

8.3.3 PRN PORT

Please find below the various selectable serial weight transmission modes of the PRN serial port through the corresponding "Pr.ModE" step of the SETUP environment.

- **TRASMISSION TO PRINTER** ("tPr" parameter): requests the use of the print key on the indicator (prints upon request of the operator). The print command is inhibited if the weight is in motion and in all other circumstances in which the data is not valid (see the "17. STANDARD PRINT EXAMPLES" chapter, **USER MAN.REF.**).

- **CONTINUOUS TRANSMISSION** ("ALL.Std" parameter): see the "ALL.Std" mode of the PC port.

- **TRASMISSION TO 6-DIGIT REMOTE DISPLAY** ("rEPE.6" parameter): see the "rEPE.6" mode of the PC port.

- **DOSAGE DATA TRANSMISSION** ("rEP.EXt" parameter):see the "rEP.EXt" mode of the PC port.

IMPORTANT: THE CONNECTION AND THE SOFTWARE CONFIGURATION OF THE SERIAL OUTPUTS MUST BE CARRIED OUT BY TECHNICAL PERSONNEL WHO KNOW THE PROCEDURES ON THE BASIS OF THE NEEDS OF THE USER.

8.4 SERIAL COMMANDS FORMAT

LEGEND: **[CC]** = instrument code, e.g. 00 (only with RS485 protocol).
<CR LF>= Carriage Return + Line Feed (ASCII characters 13 and 10).

Version reading command
[CC]VER<CR LF>
Instrument answer: [CC]VER,vvv,DGTQ-F**bb**<CR LF>
in which: vvv is the firmware version
b space character, ascii decimal 32 character.

Extended weight read command
[CC]REXT<CR LF>
Instrument answer: EXTENDED STRING (see the 8.5.2 section).

Weight read command
[CC]READ<CR LF>
Instrument answer: STANDARD STRING (see the 8.5.1 section).

Weight reading command with sensitivity times 10
[CC]GR10<CR LF>
Instrument answer: STANDARD STRING (see the 8.5.1 section).

Reading command of microvolts relative to the weight
[CC]MVOL<CR LF>
Instrument answer: STANDARD STRING (see the 8.5.1 section).
Reading command of converter points relative to the weight
[CC]RAZF<CR LF>
Instrument answer: STANDARD STRING (see the 8.5.1 section).

Tare command
[CC]TARE<CR LF> or **[CC]T<CR LF>** (short command).
Instrument answer: [CC]OK<CR LF> if the command has been RECEIVED; no answer for the T command. The instrument's response does not mean necessarily that the instrument executes the tare.

Zero command
[CC]ZERO<CR LF> or **[CC]Z<CR LF>** (short command)
Instrument answer: [CC]OK<CR LF> if the command has been RECEIVED; no answer for the Z command. The instrument's response does not mean necessarily that the instrument executes the zero.

CLEAR command
[CC]CLEAR<CR LF> or **[CC]C<CR LF>** (short command)
Instrument answer: [CC]OK<CR LF> if the CLEAR command has been RECEIVED, no answer for the C command. The instrument answer does not imply that the command is executed.
The command works also inside the SETUP ENVIRONMENT.

Test Command
[CC]ECHO<CR LF>
Instrument answer: [CC]ECHO<CR LF>.

Print Command
[CC]PRNT<CR LF> or **[CC]P <CR LF>** (short command).
Instrument answer: [CC]OK<CR LF> if the PRNT command has been RECEIVED; no answer for the P command. The OK answer does not mean necessarily that the instrument executes the printout.

Tare insertion command
[CC]TMANVVVVVV<CR LF> or **[CC]WVVVVVV <CR LF>** (short command)
in which: VVVVVV: manual tare value with the decimal point, from 1 to 6 characters; the non significant zeros can be omitted.
Instrument answer: [CC]OK<CR LF> if the TMAN command has been RECEIVED; no answer for the W command. The OK answer does not mean necessarily that the instrument executes the tare.

PC confirmation command
[CC]PCOK<CR LF>
The indicator shows on the display the "-PCoK-" message for about 2 seconds.
Instrument answer: [CC]OK<CR LF>.

Serial command which supplies the indicator status
[CC]STAT<CR LF>
Instrument answer: [CC]STATXX<CR LF>
in which XX is a decimal value which supplies the status of the indicator; the possible values are:

XX indicator status
00 normal scale status
01 normal scale status in input
02 instrument in technical setup
04 instrument in boot phase
05 instrument in rx/tx setup phase
06 instrument in test phase of the serial ports
07 instrument in print test
08 instrument in firmware update phase
09 instrument in stand-by
10 instrument in automatic zero phase
12 instrument in inputs test phase

Serial command which supplies the indicator status and the dosage status
[CC]STAT<CR LF>
Instrument answer: [CC]STATXX<CR LF>
in which XX is a decimal value which supplies the status of the indicator (see the STAT command);
YY is a decimal value which supplies the dosage status; some values are:

YY dosage status
00 Out of the dosage
02 Waiting for dosage start
03 Start of the dosage cycle
04 Waiting for the W.Start time
05 Waiting for the start of the dosage with instable weight
15 Start of the automatic dosage (DA)
18 Waiting for the slow weight to be reached (DA)
19 Waiting for flight weight to be reached (DA)
20 Waiting for the Wt.Fly time (DA)
21 Waiting for stability after the Wt.Fly time (DA)
22 Waiting for control of tolerance (DA)
23 Acquisition of the dosed weight (DA)
24 Waiting for manual dosage start (DM)
25 Start of the manual dosage (DM)
27 Waiting for the validation of the manual dosage end (DM)
28 Waiting for the validation of the out of tolerance manual dosage end (DM)
29 Acquisition of the dosed weight (DM)
30 Waiting for the start of the total unloading dosage (UL)
31 Start of the total unloading dosage (UL)
33 Waiting for the end of total unloading dosage (UL)
35 Waiting for stability in total unloading dosage (UL)
36 Waiting for the start of the partial/splitted unloading dosage (UL)
40 Waiting for the slow weight to be reached (UL)
41 Waiting for partial/splitted unloading dosage target to be reached (UL)
42 Waiting for the partial/splitted unloading dosage flight weight to be reached (UL)
43 Waiting for stability in partial/splitted unloading dosage (UL)
44 Control of tolerance in partial/splitted unloading dosage (UL)
49 Waiting for timer phase start (TM)
50 Waiting for timer phase end (TM)
52 Waiting for pause phase start (PA)
53 Waiting for pause phase end (PA)
55 Manual weight phase (MW)
57 Error-01
58 Error-02
59 Error-03
60 Error-04
61 Error-06
62 Error-07
64 Error-00
66 Return from an error status
68 Waiting in the pause status
69 Changing <n.cycle> in the pause status
70 Waiting for reset confirmation
71 Reset status
73 Exit from dosage cycle

Serial command which supplies the outputs status

[CC]OUTSN<CR LF>

in which: N is the number of the output that one want to check, from 0 to number of outputs.
Instrument answer: [CC]OUTSNXXXX<CR LF>
in which XXXX can be: 0000 (output disabled) or 0001 (output enabled) if N>0
By setting N=0, the instrument answer is the status of all outputs (in hexadecimal character)
Example:
OUT 3 = enabled → with the OUTS3 command, the answer is: OUTS30001
OUT 3 = disabled → with the OUTS3 command, the answer is: OUTS30000

If one want to read the status of all the outputs:

OUT 4	**OUT 3**	**OUT 2**	**OUT 1**
Bit 3	Bit 2	**Bit 1**	**Bit 0**
1	0	**1**	**1**

In this case, with the OUTS0 command, the answer is: OUTS0000B in which B means 1011.

Key pressure simulation command

[CC]KEYPXX<CR LF>

in which XX is the code of the pressed key:
00: ZERO key;
01: TARE key;
02: MODE key;
03: PRINT key;
04: C key
05: numeric 1 key;
06: numeric 2 key;
07: numeric 3 key;
08: numeric 4 key;
09: numeric 5 key;
0A: numeric 6 key;
0B: numeric 7 key;
0C: numeric 8 key;
0D: numeric 9 key;
0E: numeric 0 key;
Instrument answer: OK<CR LF>: accepted command.
In case the simulated key has two linked functions (key briefly pressed or at length, like the TARE key), if the KEYP command is followed by the release command of the (KEYR) key within a maximum time of 1,5 seconds, the simple function will be executed (key briefly pressed); otherwise the second function will be made (key pressed at length).

Key release simulation command

[CC]KEYR<CR LF>

Instrument answer: [CC]OK<CR LF>

Selection formula command

[CC]DSETxx<CR LF> in which XX is the selecting formula index.
Instrument answer: [CC]SETOK<CR LF>: accepted command.
[CC]ERROR<CR LF>: not present formula or already selected.

Dosage start command

[CC]DSTART<CR LF>

Instrument answer: [CC]START<CR LF>: accepted command.
[CC]ERROR<CR LF>: otherwise.

Dosage PAUSE/RESET command

[CC]DSTOP<CR LF>

Instrument answer: [CC]PAUSE<CR LF>: dosage pause – if the command is received with the dosage under way.
[CC]RESET<CR LF>: cancelling of dosage under way – if the command has been received during the pause status.
[CC]ERROR<CR LF>: if the command has been received out of the dosage status.

Set dosage TARGET command

Only for TOT.WGT mode and BATCH1-L/BATCH1-U

[CC]DTARGVVVVVVV<CR LF>

in which: VVVVVVV : target value with the decimal point, from 1 to 7 characters (including the point); the non significant zeros can be omitted.

Instrument answer: [CC]OK<CR LF>: accepted command.

The instrument answer does not imply that the command is executed.

8.4.1 SERIAL ERRORS

Upon each serial command received the instrument transmits a response which may be a response to a command (see the command description) or the indication of the command error.

ERR01<CR LF>	it is shown when a correct command is transmitted from the PC to the indicator however it is followed by letters inserted involuntarily (I.E.: READFTARES…).
ERR02<CR LF>	it is shown when a correct command is transmitted from the PC to the indicator, but containing wrong data.
ERR03<CR LF>	it is shown when a non allowed command is transmitted. It may be a command not used in the selected functioning mode or the command reaches the indicator in the instant in which the keyboard buffer is already occupied by another command.
ERR04<CR LF>	it is shown when an inexistent command is transmitted.

8.5 TRANSMISSION PROTOCOLS

The weight data transmission on the PC and PRN serial ports may take place in 3 formats: STANDARD STRING, EXTENDED STRING or EXTENDED REPEATER STRING.

8.5.1 STANDARD STRING

STRING TRANSMITTED :

[CC]hh,kk,ppppppppp,uu + CR + LF

dove:

[CC] INSTRUMENT CODE IN THE FORMAT OF TWO ASCII DECIMAL DIGITS
ONLY IN THE CASE THAT THE 485 PROTOCOL IS SELECTED (FOR EXAMPLE 00).

hh
- UL Underload
- OL Overload
- ST Stability of the display
- US Instability of the display

, Comma character

kk
- NT Net Weight
- GS Gross Weight
- GX Gross weight with sensitivity times 10
- VL Value in micro volts relative to the weight
- RZ Value in converter points relative to the weight

, Comma character

ppppppppp 8 digits (including any sign and decimal point) which identify the weight. The insignificant digits are filled with spaces. Through the MVOL and RAZF command the indicator transmits the relative value on 10 digits instead of 8.

, Comma character

uu Unit of measurement "kg" "**b**g" "**b**t" "lb" "mv" (microvolts) "vv" (converter points)

CR Carriage Return (13 ascii decimal character).

LF Line Feed (10 ascii decimal character).

The transmitted weight is the GROSS weight (GS) if no TARE WEIGHT has been entered; otherwise, the NET WEIGHT (NT) will be transmitted.

LEGEND:

b space character, 32 decimal ascii character.

8.5.2 EXTENDED STRING

STRING TRANSMITTED :

[CC]B,hh,NNNNNNNNNN,YYTTTTTTTTTT, bbbbbbbbb0,uu, + CR + LF

in which:

[CC]	INSTRUMENT CODE IN THE FORMAT OF TWO ASCII DECIMAL DIGITS JUST IN CASE THE 485 PROTOCOL IS SELECTED (FOR EXAMPLE 00)	
B	Scale number	
,	Comma character	
hh	UL	Underload
	OL	Overload
	ST	Stability of display
	US	Instability of display
,	Comma character	
NNNNNNNNNN	Net weight on 10 characters including possible sign and decimal point	
,	Comma character	
YY	"PT" if the tare is manual, otherwise YY = " " (two empty spaces) if the tare is semiautomatic	
,	Comma character	
TTTTTTTTTT	Tare weight on 10 characters including possible sign and decimal point	
,	Comma character	
uu	Unit of measure "Kg" "**b**g" "**bt**" "lb"	
CR	Carriage Return (ascii decimal 13 character)	
LF	Line Feed (ascii decimal 10 character)	

The non significant digits of the net, tare, pieces and gross weights are filled with spaces (space characters, ascii decimal 32 character).

LEGEND:

b	space character, 32 decimal ascii character.

8.5.3 MULTI REPEATER STRING

STRING TRANSMITTED :

01PPPPPPP + CR + LF
02SSSSSSS + CR + LF
03XXXXXXX + CR + LF
04YYYYYYY + CR + LF

in which:

01,**02**,**03**,**04** Repeater 485 address

PPPPPPP Net weight on 7 characters (including possible sign and decimal point) which indicate the weight actually dosed. The insignificant digits are filled with spaces.

SSSSSSS Message shown on the DGTPK-F LED display, alternating with the weight:

W.Start	Waiting for the start of the dosage.
undEr	The weight is lower than the minimum tare, waiting for dosage start.
oVEr	The weight is greater than the maximum tare, waiting for dosage start.
FF .RR	FF: BATCH mode: index of phase in the current formula. BATCH1 mode: index of the current formula. RR: - - No phase linked DA Automatic dosage DM Manual dosage UL Unloading TM Timer PA Pause MW Manual Weight
LoW	The weight is lower than the (target – tolerance) threshold.
ok	The weight is within the tolerance.
high	The weight is greater than the (target + tolerance) threshold.
PAuSE	Pause State.
rESEt?	Reset request.
Err.XX	in which XX is the number of the error (see the “ERROR MESSAGES” chapter, **USER MAN. REF).**
no.ForM	No formula selected

XXXXXXX Net weight on 7 characters (including possible sign and decimal point) which indicate the weight which is missing from reaching the target. The insignificant digits are filled with spaces.
The value is transmitted independently from the configuration of the parameter **<<ShoW.t.>>**.

YYYYYYY Alternately displayes the messages **SSSSSSS** and **XXXXXXX**.

CR Carriage Return (ascii decimal 13 character)

LF Line Feed (ascii decimal 10 character)

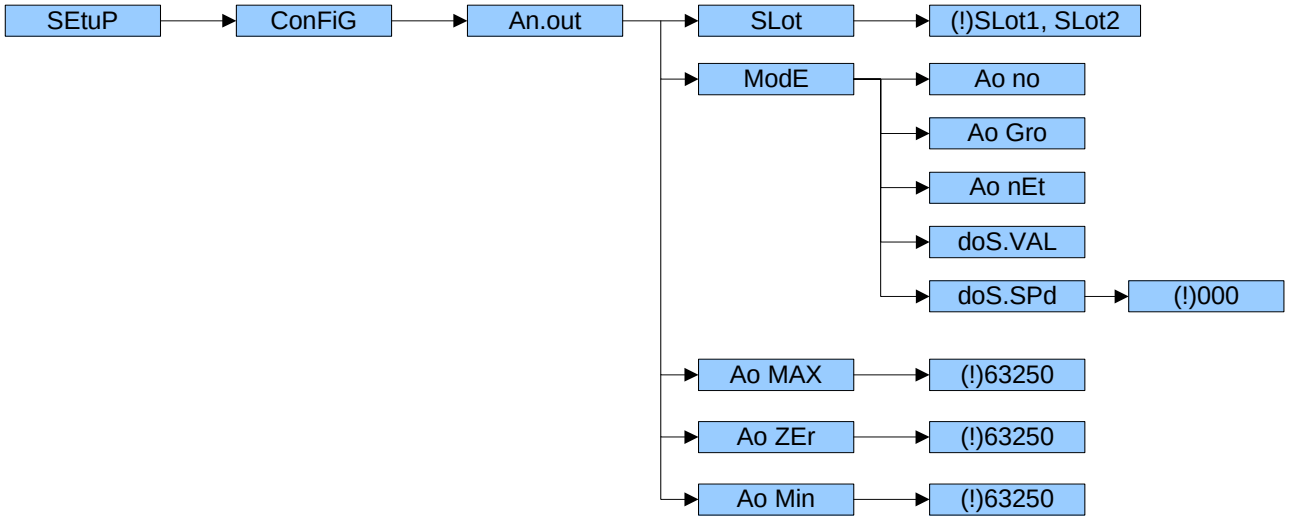
9. ANALOGUE OUTPUT

Only for DGTPKFAN model

In all the functioning modes, through an optional interface, it is possible to use an analogue output configurable at 0 – 10V, 0 – 20 mA or 4 – 20 mA. The voltage and the output current from the interface are proportional to the gross weight or net weight present on the scale. In regards to the electrical connection scheme, refer to the "CONNECTION SCHEMES" chapter.

Note: The analogue output is updated every 50 ms and takes on the value corresponding to the weight converted in that instant; therefore if the filter is slowed on the weight, the analogue output also slows down.

For configuring the parameters, one should enter the SETUP ENVIRONMENT and enter in the **SEtuP** >> **ConFiG** >> **Anout** step.



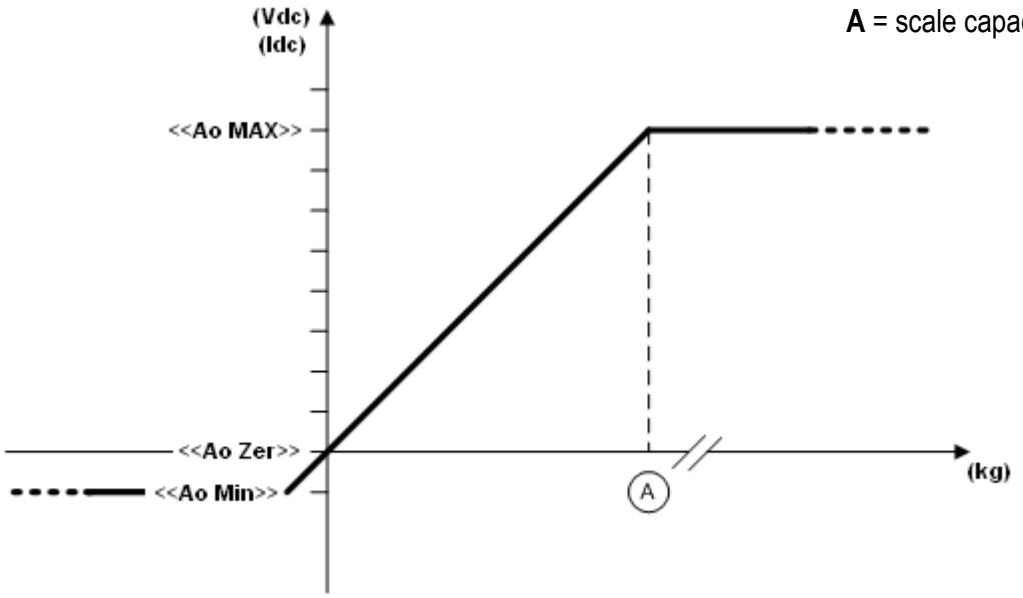
<<Slot>>

One selects the SLOT to be used with the analogue output: SLOT 1 or SLOT2; it is possible to indifferently use either SLOT.

<<ModE>>

By entering this step one selects the type of analogue output:

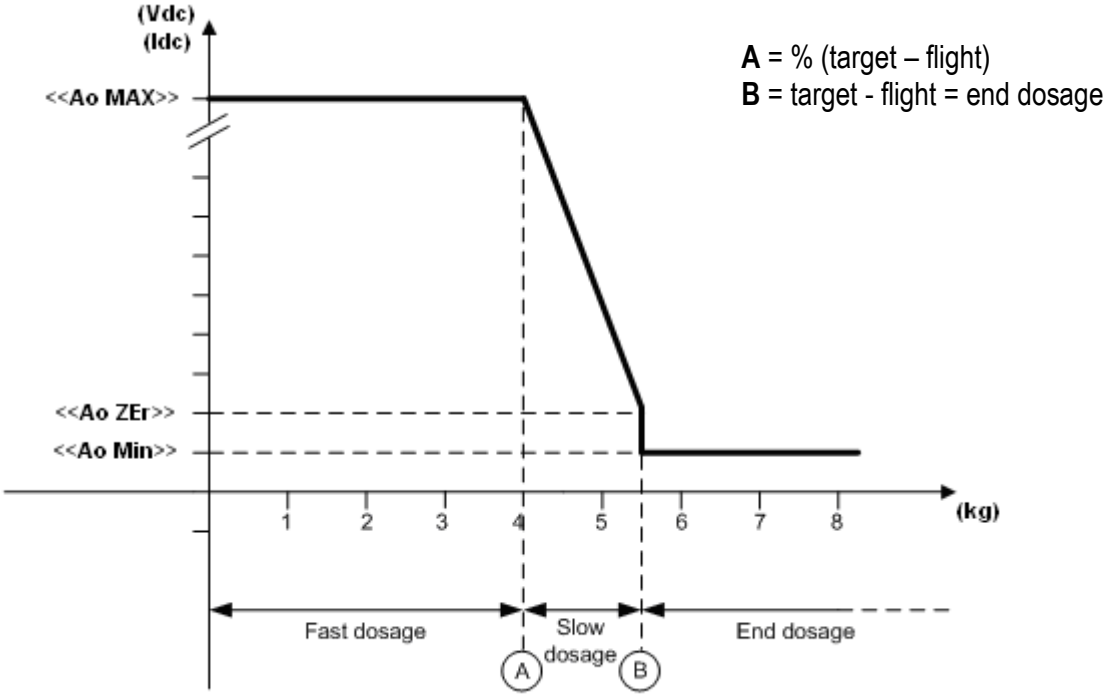
- **Ao no** = analogue output disabled.
- **Ao Gro** = analogue output on gross weight.
- **Ao nEt** = analogue output on net weight.



A = scale capacity

Analogue output on the net or gross - Example of the trend for a dosage in loading

- **dos.VAL** = the analogue output is proportional to the net weight shown on the LED display (i.e. the weight of the single component which is dosed at the moment). The output is zeroed when the formula proceeds to the next component. When the formula is completed the total weight on the scale is displayed: this value is put on the analogue output.
- **dos.SPd** = the analogue output is used to achieve the slow part of the dosage: the output decreases its value at the reaching of the target (speed proportional regulation). The percentage of (target-flight) value where the slow dosage starts is requested.
  In this way, the analogue output can be configured independently of dosage relay and of fast dosage relay.



Analogue output on the speed - Example of the trend for a dosage in loading

NOTE: If the analogue output is proportional to the speed, for the TIMER, PAUSE, MANUAL WEIGHT and TOTAL UNLOADING phases, the output remains fixed to the minimum value.

Once the functioning mode is confirmed, one sets the values of the analogue output; in other words, the digital/analogue converter values are entered (between 0 and 65535) to which corresponds a certain output value in voltage or in current.

In this configuration the instrument keys take on the following meanings (functions):

ZERO	It decreases the selected digit (blinking).
TARE	It increases the selected digit (blinking)
MODE	It selects the digit (blinking) from left to right.
PRINT	By pressing once after have a value has been entered, it enables the corresponding output analogue value (allowing the check), but remains still inside the step in case of a new modification. By pressing a second time (on the same entered value), it confirms and exits the step.
C-ON/Stb	It allows to quickly zero the present value.
NUMERIC KEYS	Allow to enter numeric values, from right to left.

<<Ao MAX>>
By entering this step, one sets the maximum value of the analogue output, in other words the value corresponding to the full scale capacity and in the overload condition. This value can be anywhere between 0 and 65535 (values of the digital/analogue converter); if a higher digit is entered, the instrument zeros the value just entered.

<<Ao ZEr>>
By entering this step, one sets the analogue output value when the scale displays zero weight (supplied when the scale is in underload). This value can be anywhere between 0 and 65535 (values of the digital/analogue converter); if a higher digit is entered, the instrument zeros the value just entered.

<<Ao Min>>
By entering this step, one sets the minimum value of the analogue output, in other words the value corresponding to the underload condition. This value can be anywhere between 0 and 65535 (values of the digital/analogue converter); if a higher digit is entered, the instrument zeros the value just entered

APPROXIMATE VALUES BETWEEN THE D/A CONVERTER AND ANALOGUE OUTPUT

D/A CONVERTER VALUES	VOLTAGE VALUE (V)	CURRENT VALUE (mA)
1200	0	0
12700		4
58600		20
62650	10	

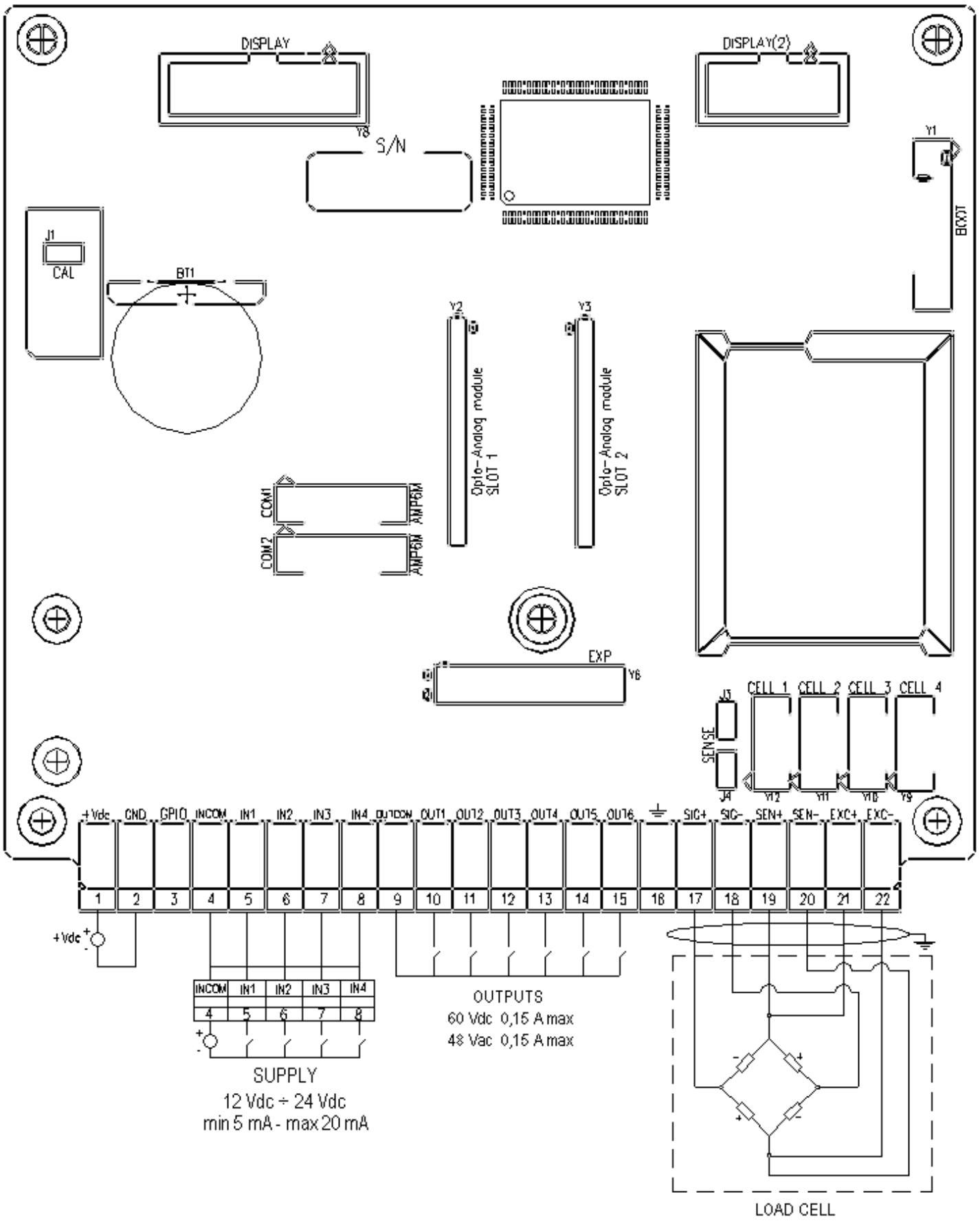
10. PROGRAMMING INDICATOR FROM PC

In addition to the manual mode, one can program phases and formulas also through the **DINITOOLS ™** software for PC, and transmit these to the indicator through the serial line.

For a correct use of the scale, the programming must respect the following rules:

- whenever one changes the functioning mode, a new scale in DINITOOLS has to be created;
- avoid transmitting/receiving setups or databases of scales which differ from the one they are created for;
- the phases must be inserted before the formulas;
- the formulas must be deleted before the phases included in these;
- when the PC transmits the formulas/phases to the indicator, the message “WAIT.PC” is displayed for a few seconds.

11. CONNECTION SCHEMES



MEANING OF THE TERMINAL BOARD AND MOTHER BOARD JUMPERS

- **VE 12 / 24 Vdc POWER SUPPLY**

1. *+24Vdc* +12 / 24 Vdc
2. *GND* 0 Vdc (GND)

- **CELL LOAD RECEPTORS**

CELL1:

17. *SIG+* SIGNAL +
18. *SIG-* SIGNAL -
19. *SEN+* SENSE +
20. *SEN-* SENSE -
21. *EXC+* EXCITATION +
22. *EXC-* EXCITATION -

CELL1, 2, 3, 4 – 4-Pin AMP Connector

1. *EXC+* EXCITATION +
2. *EXC-* EXCITATION -
3. *SIG+* SIGNAL +
4. *SIG-* SIGNAL -

!! IMPORTANT !!

If one wants to use 4 wires in the CELL 1 terminal board (without using the SENSE signal), one should short-circuiting -SEN with -EXC and +SEN with +EXC.

- **CALIBRATION JUMPER**

J1 = if closed, it enables the access to the metrological parameters

- **I/O BOOT**

Connector for the connection of the ALIBI MEMORY board.

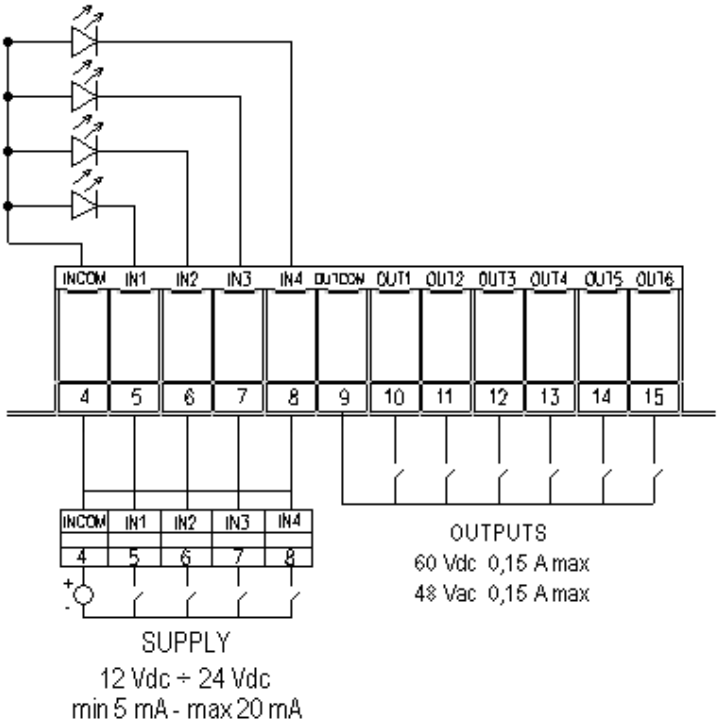
- **COM1 RS 232 SERIAL PORT (AMP CONNECTOR)**

1. *TX1* Transmission
2. *RX1* Reception
6. *GND* GND

- **COM2 RS 232 SERIAL PORT (AMP CONNECTOR)**

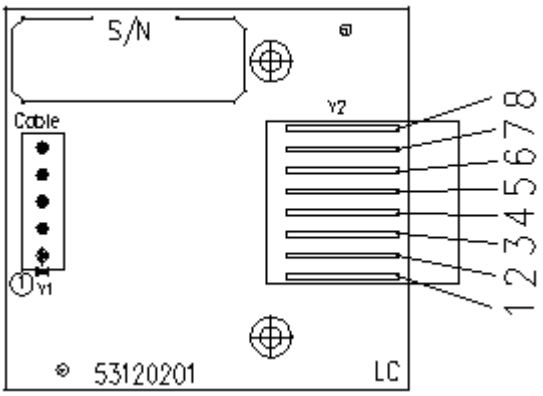
1. *TX2* Transmission
2. *RX2* Reception
3. *CTS2* Synchronism signal
6. *GND* GND

- **INPUTS (OPTOISOLATOR PHOTOCOUPLERS) AND PHOTOMOSFET OUTPUTS** (for all the versions)



The maximum power of the outputs 48 Vac 0,15 A max (or 60 Vdc 0,15 A max), the maximum voltage applicable to the inputs is between 12 ÷ 24 Vdc with current from minimum 5 mA to maximum 20 mA.

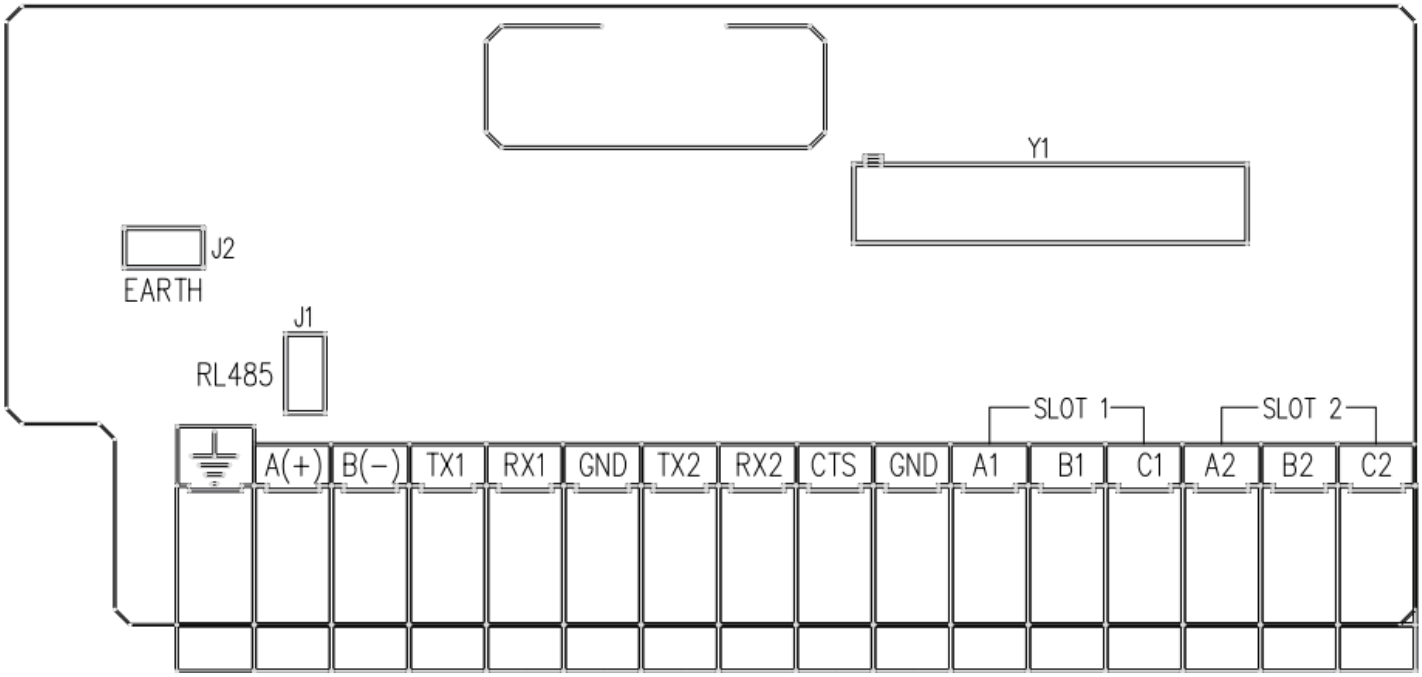
RS232 SERIAL PORT (RJ45 CONNECTOR)



PLUG6 CONNECTIONS:

Y2	PLUG6	DB9	COLOUR	MEANING
1				
2	**1**		ORANGE-WHITE	
3	**2**	**3**	**BLUE-WHITE**	**RX**
4	**3**		BROWN	
5	**4**	**5**	**GREEN-WHITE**	**GND**
6	**5**	**2**	**ORANGE**	**TX**
7	**6**		WHITE-BROWN	
8				

11.1 EXPANSION BOARD



MEANING OF THE TERMINAL BOARDS AND EXPANSION BOARD JUMPERS

- **ANALOGUE OUTPUT** (DGTPKFAN version)

SLOT 1 (I/O 1)
33. ***I+*** + 20 mA
34. ***COM*** (GND)
35. ***V+*** + 10 V

SLOT 2 (I/O 2)
36. ***I+*** + 20 mA
37. ***COM*** (GND)
38. ***V+*** + 10 V

Note: the maximum resistance applicable on the output current is 350 Ohm and the minimum resistance applicable on the output voltage is 10 kohm.

- **RS 485 SERIAL PORT**

24. A(+) 485 + Line
25. B(-) 485 - Line

- **COM1 RS 232 SERIAL PORT**

26. ***TX1*** Transmission
27. ***RX1*** Reception
28. ***GND*** GND

- **COM2 RS 232 SERIAL PORT**

29. ***TX2*** Transmission
30. ***RX2*** Reception
31. ***CTS2*** Synchronism signal
32. ***GND*** GND

J1: if closed, it enables the terminal resistance of 120Ω (RT).

J2: if closed, it enables the ground connection of the expansion board.