Operating instruction

Number of instruction:
LMI-23-03/06/08/ENG

Moisture analyzer
MAC series

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Detta är första versionen av en översättning till svenska där användardelarna på sidan 29 – 45 är på svenska och dom tekniska bitarna är på engelska.

Nytt i denna instruktion är en ”lathund” för uppstart av vattenhaltsvåg MACxxx för spannmål. Denna har gjorts av Staffan Johansson Tidö Foderautomatik AB. Den kommer sist i instruktionen. Sida 48 - 52

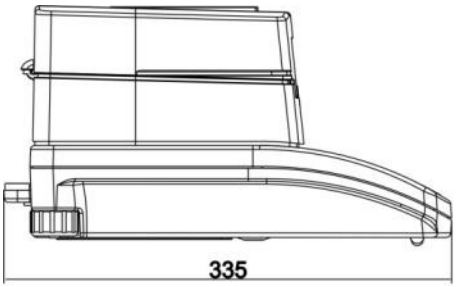
Instruktion MAC Rev 02.2009

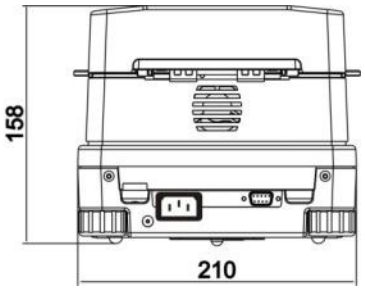
JUNE 2008

1. TECHNICAL PARAMETERS

Type	MAC 50/1	MAC 50	MAC 110	MAC 210
Max capacity	50 g	50 g	110 g	210 g
Reading unit	0,1 mg	1 mg	1 mg	1 mg
Tare range	- 50 g	- 50 g	- 110 g	- 210 g
Max mass of sample	50 g	50 g	110 g	210 g
Accuracy of moisture reading	0,01 / 0,001% (0,001% for samples to 1,5g)		0,01 %	
Drying temperature range	max. 160°C (optional 250°C)			
Drying modes	standard, quick, step, mild			
Auto switch off options	time defined, moisture stabilisation, time optimal, manual			
Working temperature	+15 °C - +40 °C			
Power supply	Adaptor 230V 50Hz AC / 420W			
Display	LCD (backlit)			
Drying chamber dimensions	120 x 120 x 20 mm			

Dimensions:





2. BASIC INFORMATION

CAUTION!
Utilization of MAC moisture analyzer conversely to safety provisions and user manual may be hazardous to health and life. Never use the moisture analyzer is explosive area. Moisture analyzer is not prepared to use in areas with danger of explosion. The interior part of drying chamber may heat up to 400 °C. nominal power supply of moisture analyzer is 230 V, thus it is necessary to use the device according to safety principles. The symbol visible on the top of the moisture analyzer cover (as presented below) is a warning against hot surface.

2.1. Balance appropriation

Moisture analyzer is a device used for determination of relative humidity of small samples of various materials, determination of dry mass in small samples of various materials and determination of mass of weighed objects. It guarantees fast and precise determination of water content in tested sample, and through application of LCD or graphic display it provides easy use and operation. Moisture analyzer series MAC can be used to determine humidity content of multiple materials.

At the initial stage of measurement, the device precisely determines the mass of object placed on its weighing pan. Following this, there is fast heating of the sample with halogen or IR lamps. This causes evaporation of humidity from the tested sample. While sampling, the moisture analyzer is continuously checking the decline of mass, and after calculation, it displays current indications on the display of the balance.
Compared to conventional methods of humidity content determination in various materials, application of moisture analyzer series MAC significantly shortens measurement time and simplifies testing procedure. Moisture analyzer allows for setting of multiple parameters which influence testing of a sample, like temperature, time, drying profiles, etc.

2.2. Usage conditions

CAUTION!
If drying process is active do not allowed to open drying chamber. Moisture analyzer is equipped with a halogen lamp which is very powerful heat source. Thus, user should pay special attention no to touch those elements of moisture analyzer that get hot while drying procedure (disposable pan, handle of pan, and internal cover of drying chamber). Please remember, that some elements may become dangerous if heated (poisoning vapours, danger of ignition or explosion).
Moisture analyzer can not be used for dynamic weighing. Even if small masses are added to taken off from weighing pan, than weighing result should only be read if stability marker ◣◢ is displayed. Do not put magnetic materials on weighing pan of a moisture analyzer. This can defect the measuring set of the device. Do avoid dynamic loading of weighing pan, and do not exceed maximal capacity of the device. Please consider applied tare mass when calculating mass of tested object. Never use moisture analyzer in explosive area. Moisture analyzer is not designed and adjusted to operate in explosive conditions. Do not perform any modifications to the device.

2.3. Principles of safety operation

Use of MAC moisture analyzer conversely to safety principles and user manual may be hazardous to operator's health and life. It is obligatory to acknowledge with safety principles listed in user manual:

- use moisture analyzer onto to determine humidity content in samples and determination of sample mass. Any other use of moisture analyzer may be dangerous either to the device or the user,
- before switching on the moisture analyzer, make sure that the nominal power of the device specified on its data plate, is compatible with the supply in the mains to which moisture analyzer is connectable,
- **change of halogen can be carried out only in authorized service**,
- protect moisture analyzer against contacts with liquids,
- as the area around moisture analyzer gets heated, do not put any inflammable objects or substances in close distance to device,
- substance containing toxic or caustic vapour should be tested in a chamber which absorbs the vapours,
- samples of substances that produce inflammable vapours if heated should have relatively small mass, and drying process should be performed in low temperatures,
- please remember that aggressive substances may cause corrosion to the device.

2.4. Warranty

Warranty does not cover below mentioned cases:

- Not observing the regulation listed in user manual,
- Use of the moisture analyzer conversely to its application,
- Any modifications of moisture analyzer,
- Mechanical defects and defects caused by media, liquids and natural wearing off,
- Improper placing of defects of electrical network / mains,
- Overloading of measuring mechanism of the moisture analyzer.

2.5. Supervision over metrological parameters of moisture analyzer

Metrological features of the moisture analyzer should be checked by the user in set period of time. This period depends on environmental factors of moisture analyzer's location, kinds of performed processes and quality system introduced byte user.

2.6. Data in user manual

Read the user manual carefully before switching on the device, even if the user is experienced with this kind of devices.

2.7. Operation competence

Moisture analyzer should only be operated and supervised by trained personnel with experience in usage of this kind of devices.

3. TRANSORT AND STORAGE

3.1. Delivery check

Please check delivered package and device immediately after receipt and evaluate whether its free from any external defects.

3.2. Packaging

Please keep on stock all the elements of the packaging, in case future transport of a moisture analyzer is needed. Only the original packaging of the moisture analyzer is suitable for transportation purposes. Before packing, please unplug the device from mains, and take out all moveable parts (pan, covers, etc.). parts of moisture analyzer should be put into original packaging, so that they are protected while transport.

4. UNPACKING, INSTALLATION AND DEVICE CHECKING

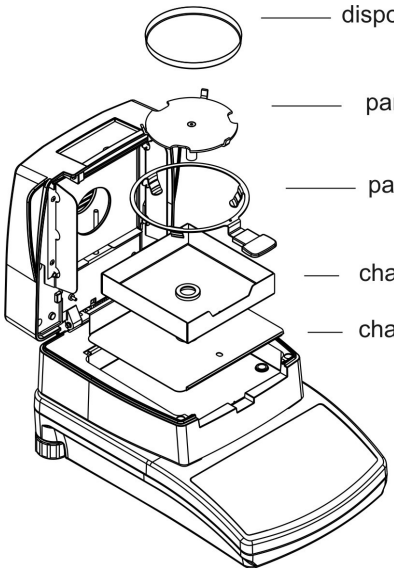
4.1. Place of installation, place of use

- Moisture analyzer should be stored and used in places free from vibration and shakes, free of wind and breeze, dust free and not higher than 2000 meters above sea level,
- Operation place should be situated in place with good air circulation, especially around the device (20 cm around the moisture analyzer, and 1 meter from top of the device).
- Room temperature should equal:
  $+15\ ^{\circ}C \div +40\ ^{\circ}C$,
- Relative humidity of operation room should not exceed 80% in 31°C, and decrease linearly to 50% of in 40°C,
- Moisture analyzer should be placed on a wall console or a stable table, free of vibration and shakes , and distant from heat sources,
- Special attention should be paid to weighing magnetic materials, as balance is equipped with a strong magnet.

4.2. Unpacking

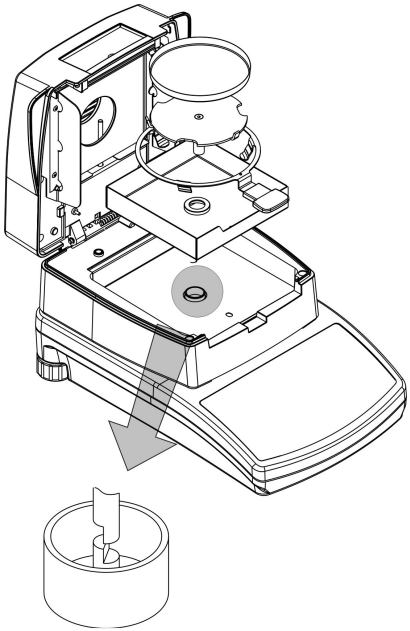
Gently take the moisture analyzer from package, take off plastic, cartoon and foil transport protections, and gently put the device in previously prepared operation place. Install components of moisture analyzer according to below schema:

Montage schema for parts of moisture analyzer:



- Install cover of drying chamber,
- Install weighing pan handle,
- Install pan supporter,
- Put disposable weighing pan in prepared place.

Setting pan supporter:

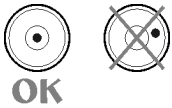


When installing weighing pan supporter, pay special attention to positioning of the weighing pan mandrel cross. The mandrel is equipped with special cut for unique positioning of the handle towards the cross, which eliminates their contact and friction. Positioning of weighing pan cross:

- After placing the weighing pan cross on the mandrel, turn the cross slightly, so that the cutting on the mandrels are situation in correct position,
- When turning the mandrel, use most gentle movements so that mechanism of the moisture analyzer is not damaged

4.3. Setting

Before switching on the device, please level the moisture analyzer using the feet situated at the back of its casing. The bubble of the level should be situation in the centre of the ring.



4.4. List of standard elements of the delivery

- Moisture analyzer.
- Insert for base of the drying chamber.
- Drying chamber cover.
- Pan holder.
- Cross.
- Disposable pan.
- Power cable.
- User manual.

4.5. Cleaning of moisture analyzer

Moisture analyzer should be cleaned with use of a damp cloth. Gently rub dirty places. Weighing pan must be removed from the moisture analyzer for cleaning. **Cleaning weighing pan when it is installed may cause damage of moisture analyzer mechanism. Remember about disconnecting the moisture analyzer from power supply before the cleaning.**

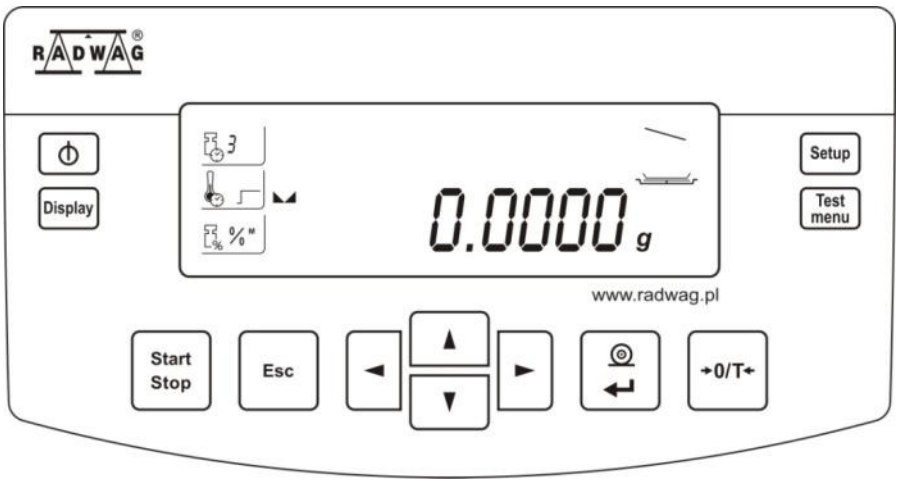
4.6. Connecting to mains

Moisture analyzer can be connected to mains only by means of original supply wire which is basic equipment of balance. Rated voltage (given on data plate) should be consistent with mains rated voltage.
Supply wire can be connected only to socket with ground contact. Switch on supply of moisture analyzer – plug of supply wire should be connected to the socket on the back of analyzer casing.
Display of moisture analyzer will indicate name and number of program, next display will indicate 0.000 g (for balances with accuracy of 1 mg) or 0.0000 g (for balances with accuracy of 0,1 mg). If indication is different from zero, press **TARE** key.

4.7. Connection of additional equipment

Before connection of additional equipment or its change (printer, computer PC), disconnect the moisture analyzer from power supply. Only additional equipment which is recommended by the manufacturer of moisture analyzer can be connected to it. After connecting the devices, plug in the moisture analyzer to power supply.

5. KEYBOARD OF MOISTURE ANALYZER



Start Stop	**Start/Stop** key – switch on/ off process of drying according to chosen program.
Esc	**Esc** key, resignation from introduced changes / exit to one level higher in menu.
◄ ▲ ▼ ►	Group of navigation keys – change of parameters value; moving in menu.

	**Print**/**Enter** key – sending display state to external device (Print) or confirmation of chosen value or function (Enter).
	**TARA** key – zeroing the indications.
	**On**/**Off** key – switch on/off display of moisture analyzer. After switch off the display, other subassemblies are supplied, moisture analyzer will be in standby mode
	**Display** key – changes type of data displayed during and after drying process.
	**Setup** key – enter to main menu.
	**Test menu** key – starting choice of drying modes.

6. STARTING THE OPERATION

After disconnection from mains, moisture analyzer will carry out the display test (All display marks will be indicated), display name and number of program and move to weighing function.

6.1. Temperature stabilization time of moisture analyzer

Before measurements, wait until moisture analyzer reaches temperature stabilization. It is time of self-heating. For moisture analyzers which before switch on were stored in much lower temperature (e.g. during winter), time of adjustment and heating is together about 4 hours. During temperature stabilization, display indication might change. Appropriate operation of moisture analyzer is possible in temperature range given in technical parameters in point 1. Moisture analyzer should be used in place with small (slow) changes of ambient temperature.

7. USER MENU

User menu is divided into 5 basic function groups.

7.1. Moving in user menu

User moves in menu by means of analyzer keyboard:

	Enter to main menu
	Navigation key – choice of parameters group upwards menu / change of parameter value one value up. Key **Up**.
	Navigation key – choice of parameters group downwards menu / change of parameter value one value down. Key **Down**.
	Navigation key – choice of parameters group, which is to be activated. After pressing the key, display will indicate first parameter from chosen group. Key **Right**.
	Navigation key – exit one level higher, e.g. to main menu. Key **Left**.
	Resignation from the change of the parameter. Key **Esc**.
	Approval / acceptation of introduced changes. Key **Print**/**Enter**.

Names of functions groups and their contents are shown below:

P1 CAL [Calibration]

P1-01 ECAL		[external calibration]
P1-02 tCAL		[calibration test]
P1-03 tE_CAL		[calibration of drying chamber]
P1-04 CALr		[report from calibration]

P2 GLP [Good Laboratory Practice]

P2-01 USr	_	[name of user]
P2-02 PrJ	_	[name of project]
P2-03 Ptin	YES/no	[printout of measurement time]
P2-04 PdAt	YES/no	[printout of meauserement date]
P2-05 PUSr	YES/no	[printout of user name]
P2-06 PPrJ	YES/no	[printout of project name]
P2-07 PId	YES/no	[printout of factory number of balance]
P2-08 PFr	YES/no	[printout of frames]

P3 tinnE [Date / Time]

P3-01 StinnE		[time setting]
P3-02 SdAtE		[date setting]

P4 rEAd [Main user parameters]

P4-01 AuE	Stand/SLouu/Fast	[filtering level]
P4-02 Auto	On/OFF	[autozero]

P5 Print [Date transmission – RS 232]

P5-01 bAud	2400/4800/9600/19200	[speed transmission]
P5-02 PStb	YES/no	[result printout: stable or unstable]
P5-03 LinE_t	1/2/3/5/10/20/30/60/120/180	[printout time]

P6 othEr [Other functions]

P6-01 Libr		YES/no	[program library]
P6-02 bL		YES/no	[backlight]
P6-03 bEEP		YES/no	[beep]
P6-04 PrnS			[parameters printout]

7.2. Back to weighing function

CAUTION
Introduced changes in memory of moisture analyzer will be saved after return to weighing with application of saving changes procedure.

Press few times key **Esc**, until display indicates **SAuE ?**

After indication, press:

- **Print**/**Enter**  - changes confirmation
- **Esc** 

- resignation from introduced changes.

8. WEIGHING

Before measurements or in case of significant external conditions changes (e.g. big changes of ambient temperature) moisture analyzer should be calibrated. Procedure of calibration is described in further part of instruction.

- before measurements load the pan few times with load close to max capacity,
- after unload, check if unloaded moisture analyzer indicates zero and if measurement is stable - symbol ◣◢, if not press key **TARA**,

- place on the pan of moisture analyzer weighed load and when indications are stable, read out the weighing result from the display,
- mass indication of placed on pan can be tarred many times by pressing **TARA** key (sum of tares mass introduced to memory of moisture analyzer can not exceed its max capacity).

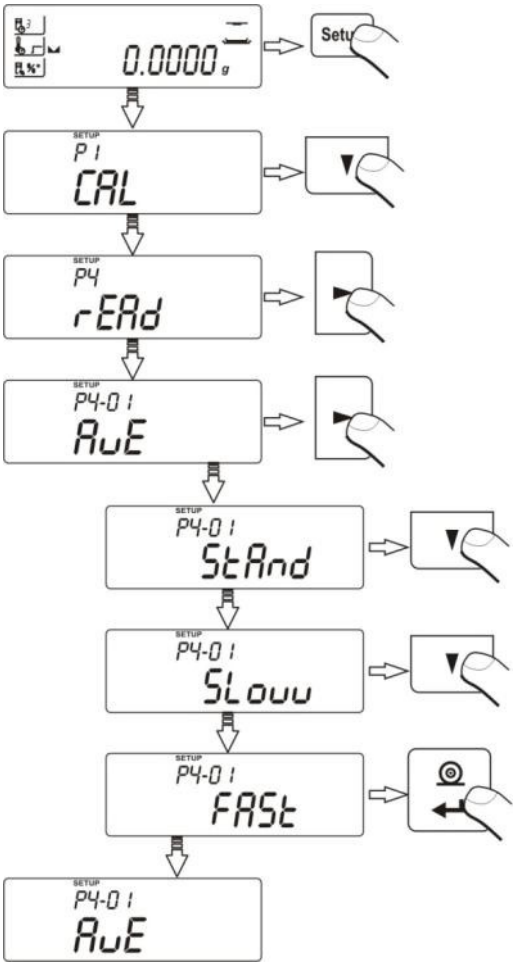
During break between measurements series, do not disconnect the balance from mains. It is advised to switch off only the display with **On**/**Off** key. After pressing **On**/**Off** key**,** moisture analyzer is ready to operate.

9. MAIN PARAMETERS OF MOISTURE ANALYZER. ADJUSTMENT OF MOISTURE ANALYZER TO CONDITIONS IN OPERATION PLACE

- Setting filter mode – **AuE**.
- Autozero function – **Auto**.
- Access to library of drying programs – **Libr**.
- Weighing result backlit - **bl**.
- Signal „beep" – reaction to pressing the key – **bEEP**.

User can adjust the balance to external environmental conditions (change of Digital filters), or to one's need (autozero operations or display backlit), thanks to parameters in group of functions connected to adjustment of balance to conditions in place of use.

9.1. Filter setting



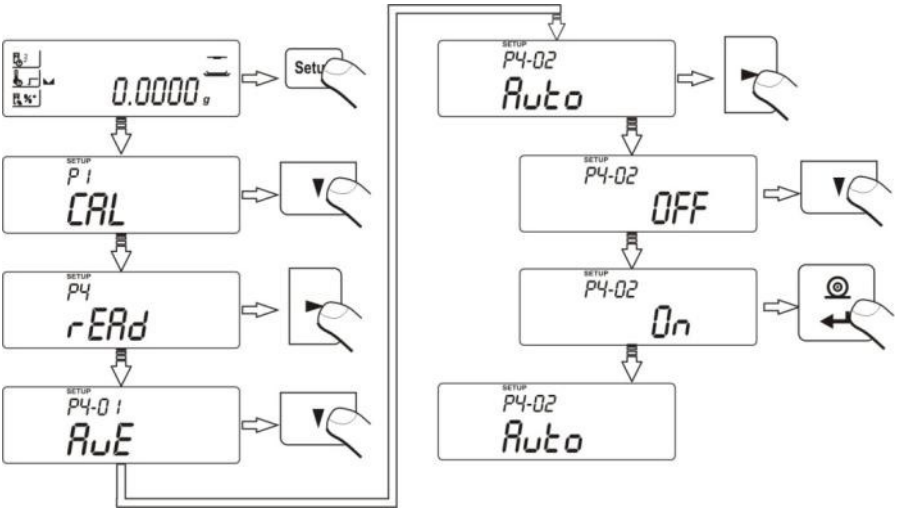
- Using navigation keys, choose value of filter which is needed,

AuE = StAnd **-** (standard) – normal operating conditions,
AuE = Slouu **-** (slow) – bad operating conditions – vibrations etc.,
AuE = Fast - (fast) – good operating conditions – without vibrations etc.

CAUTION
The higher filtering mode, the longer weighing time.

9.2. Autozero function

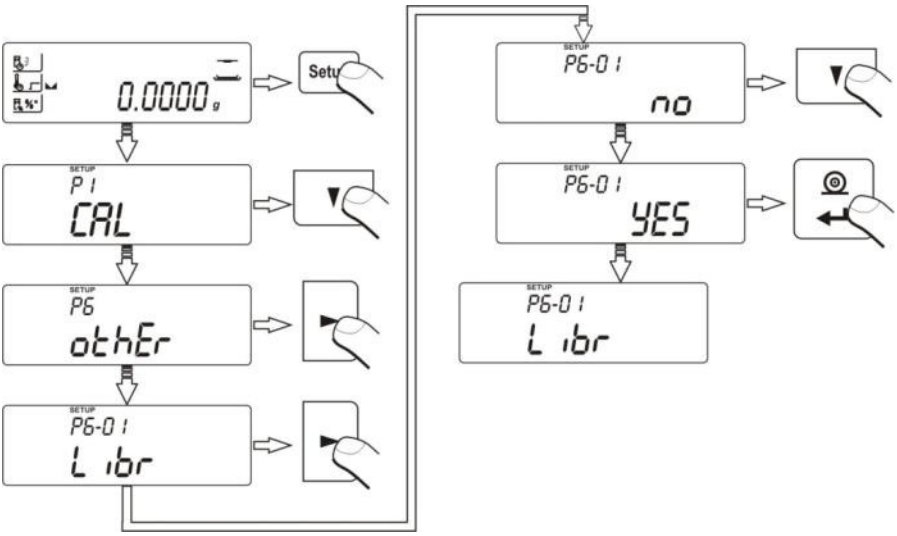
To assure accurate indications of moisture analyzer, program autozero function was introduced (**Auto)**. The task of this function is automatic control and correct of moisture analyzer zero function. When function is active, comparison of consecutive results takes place in declared time intervals e.g. every 1 s. If these results vary of value smaller than in declared range of autozero e.g. 1 division, then moisture analyzer automatically zeroes and marker of stable result is displayed – ◣◢.
When autozero function is on, then each measurement starts from precise zero. There are special cases when this function interrupts in measurements. Such example can be very slow loading the pan (e.g. exact load). In such case zero indication correction system can also correct indication of Real mass load.



Auto = On - autozero on,
Auto = OFF - autozero off.

9.3. Access to library of drying procedures

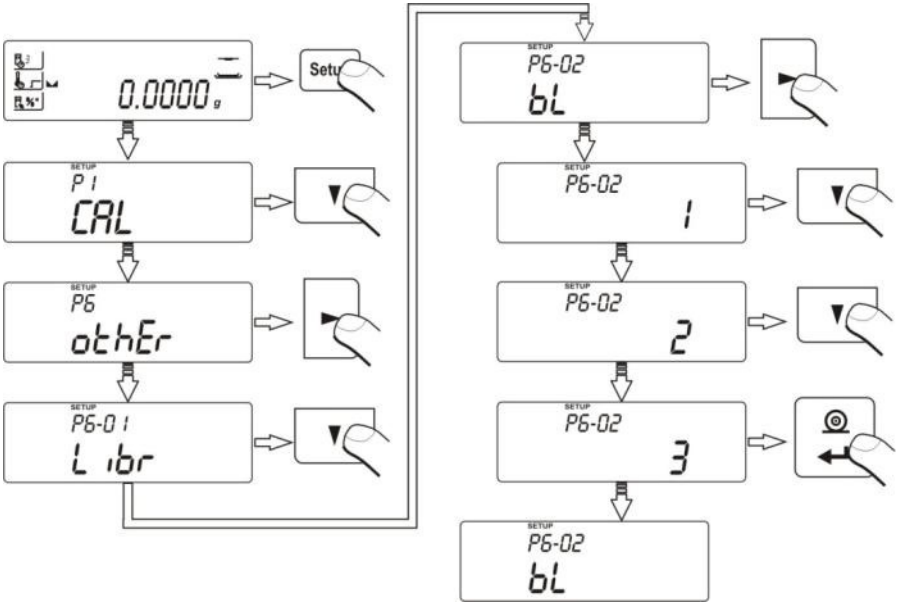
To use programs procedures library choose one of the options:



no **-** drying programs libraries are not accessible,
YES - drying programs libraries are accessible.

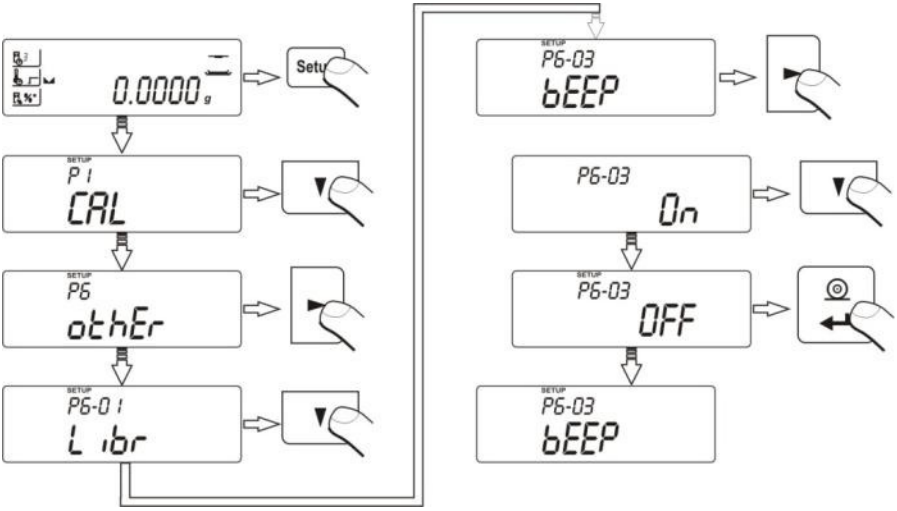
9.4. Backlit of weighing result (display screen)

Function enables to switch on or off backlit of weighing result.



bl = 1 - backlit on,
bl = 2 - backlit on permanently,
bl = 3 - backlit on temporarily.

9.5. Signal „beep" – reaction to pressing the key



bEEP = On - signal beep on,
bEEP = OFF - signal beep off.

10. CALIBRATION

Because acceleration of gravity (gravity force) changes depending on geographical location, each moisture analyzer should be adjusted to place of use.Calibration process must take place during first installation of moisture analyzer in its place of use and after each change of this place (similarly to change of ambient temperature).
To ensure high accuracy, periodic check of moisture analyzer accuracy by carrying out calibration is required.

Calibration should be carried out:

- before starting the weighing,
- when there are long breaks between consecutive measurement series.

Type of calibration:

- calibration with external calibration mass

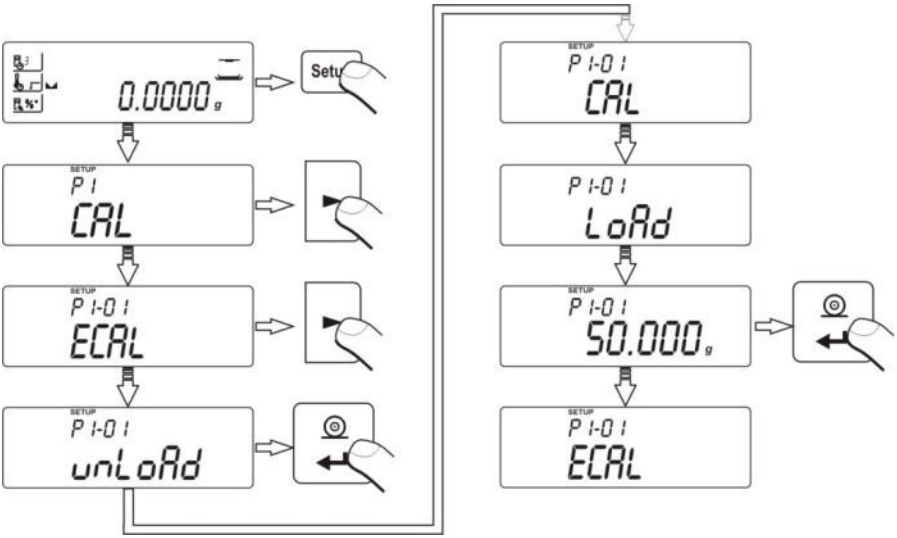
Remember to carry out the calibration when pan is unloaded!
In case when pan is overloaded, display will indicate **Er 1 Hi**.

Calibration process can be stopped when needed. To stop the calibration press **TARA**.

10.1. External calibration

External calibration should be carried out by means of calibration mass class F2 or more precise one.

Start process of external calibration,



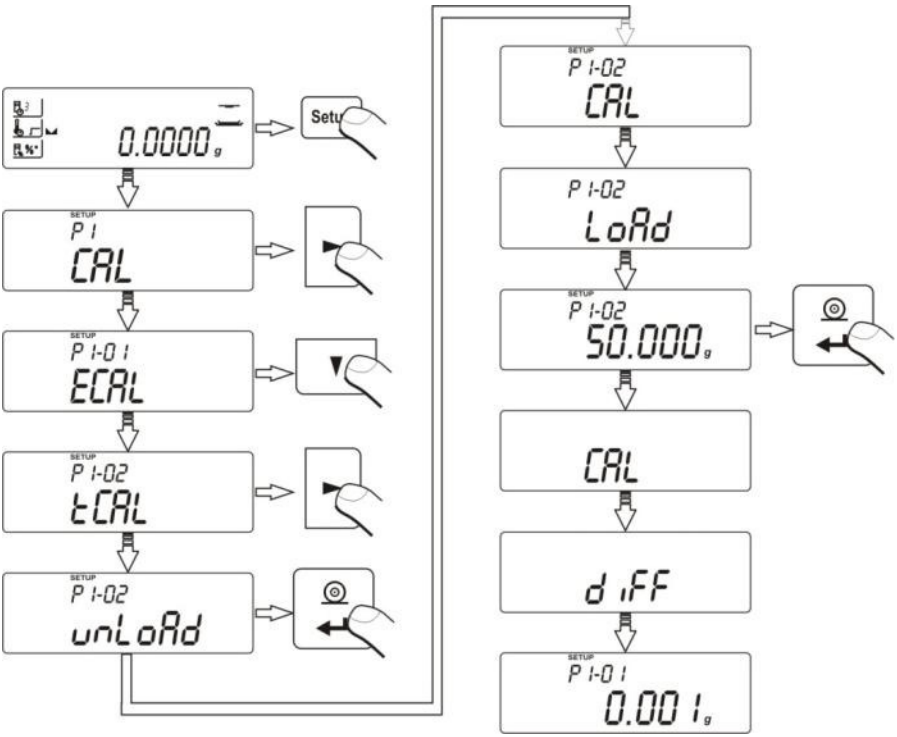
choose function **CAL**, balance will display indication **unLoAd** – unload the pan (**pan must be empty)** and press key **Print**/**Enter**. Display will indicate value of calibration mass which should be placed on the pan – press key **Print**/**Enter**. When calibration is completed, moisture analyzer will return to menu **P1-01 ECAL**.

CAUTION
*- To stop calibration process, press key **Esc**.*
- In case when pan is loaded during calibration, display will indicate **Er 1 Hi**.

Return to weighing
(according to procedure in 8.2 – return to weighing function).

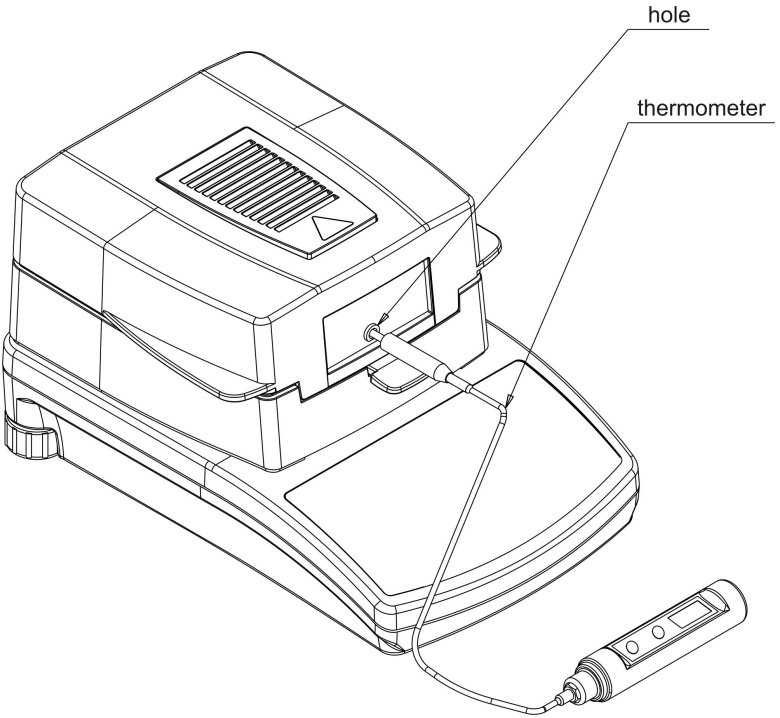
10.2. Calibration test

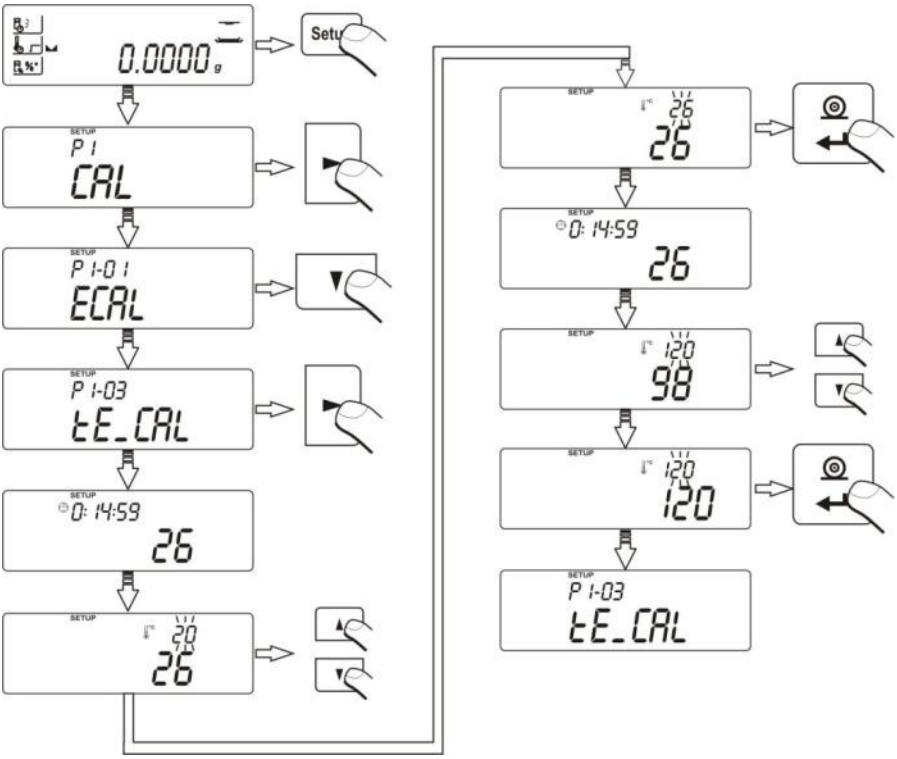
It consists in comparison of calibration mass with value of last calibration saved in balance memory. This process takes place automatically and display indicates its result (if balance is connected through RS 232 port to computer or to printer, calibration test will be printed). After pressing key **Print**/**Enter**, display will return to previous window.



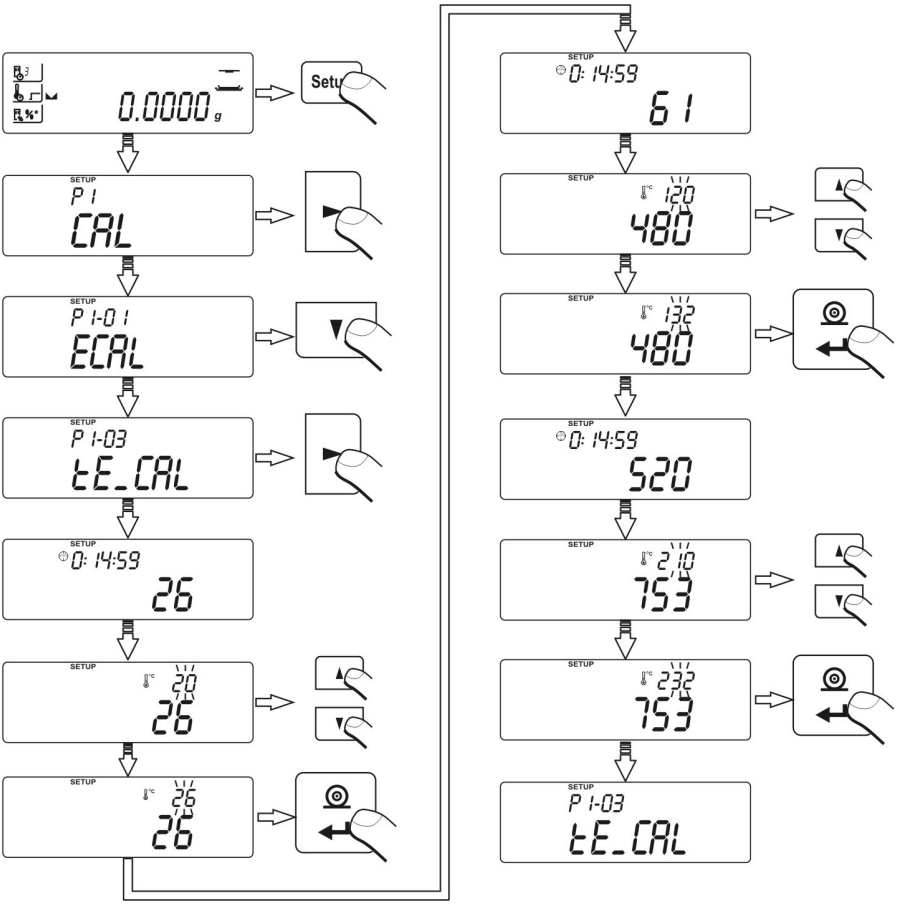
10.3. Calibration of drying chamber

Calibration of drying chamber is a process which task is to calibrate temperature sensor of moisture analyzer. To carry out the temperature calibration of moisture analyzer, place the control thermometer in drying chamber hole as show on the picture below.





Choose menu **P1-03 tE_CAL**, calibration process will be initiated. Display indicates current temperature of moisture analyzer. After 15 minutes display will indicate (pulsing) temperature value. Set temperature current temperature of moisture analyzer. Using key **Print**/**Enter**, start further part of calibration. Moisture analyzer will switch on halogen and during next 15 minutes will be heating up drying chamber and displaying current temperature. Afterwards, display will indicate pulsing value, which should be change according to current temperature off moisture analyzer. After inserting the temperature, finish calibration process with key **Print**/**Enter**.



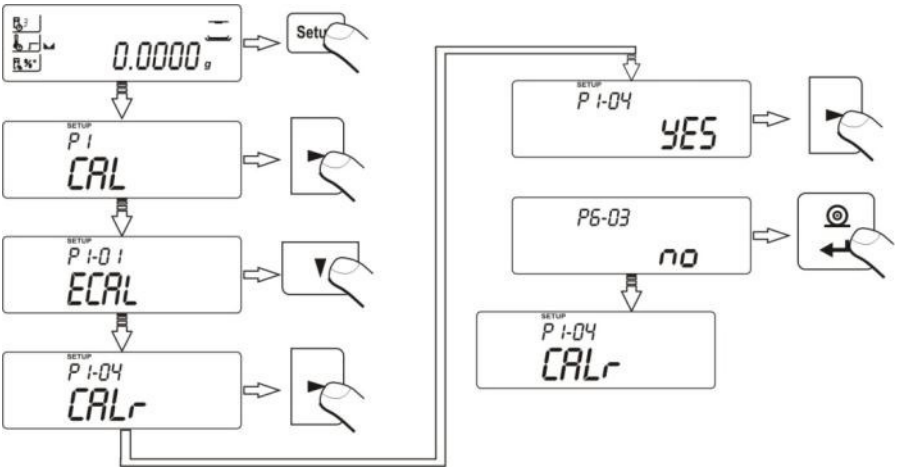
Only for moisture analyzer with drying temperature 250 °C.

Display indicates current temperature of moisture analyzer. After 15 minutes display will indicate (pulsing) temperature value. Set current temperature of moisture analyzer. Using key **Print**/**Enter**, start further part of calibration. Moisture analyzer will switch on halogen and during next 15 minutes will be heating up drying chamber and displaying current temperature. After 15 minutes display will indicate (pulsing) temperature value. Set current temperature of moisture analyzer. Using key **Print**/**Enter**, start further part of calibration. Moisture analyzer will switch on halogen and during next 15 minutes will be heating up drying chamber and displaying current temperature. Afterwards, display will indicate pulsing value, which should be change according to current temperature off moisture analyzer. After inserting the temperature, finish calibration process with key **Print**/**Enter**.

Return to weighing
(according to procedure in 8.2 – return to weighing function).

10.4. Calibration report printout

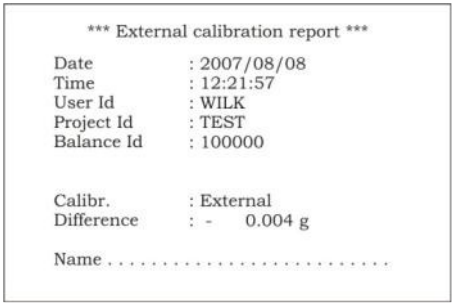
After each calibration report can be printed. The report is printed on external printer or sent to computer and recorded in the file to archiving.



YES - report will be printed.
no - report will not be printed

Remember that after setting parameter to value **YES**, report will be generated and sent automatically.
Contents of calibration report depends on balance settings in **GLP** submenu. All options which have YES attributes, will be printed.

Exempel på utskrift av kalibreringsrapport:



*** External calibration report ***

Date	: 2007/08/08
Time	: 12:21:57
User Id	: WILK
Project Id	: TEST
Balance Id	: 100000
Calibr.	: External
Difference	: - 0.004 g

Name . . . . . .

11. UTSKRIFT AV GLP-PARAMETRAR

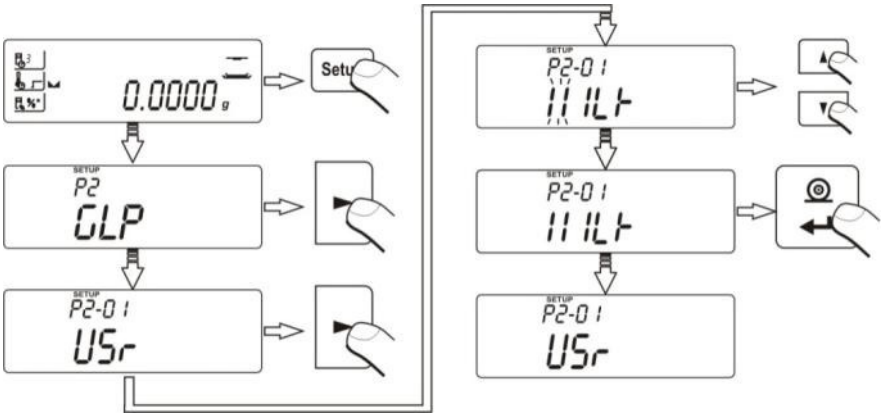
P2 GLP utgör en grupp parametrar med inställningsbara variabler. Dessa variabler ingår i kalibreringsrapporer och utskrifter av märresultat.

P2 GLP

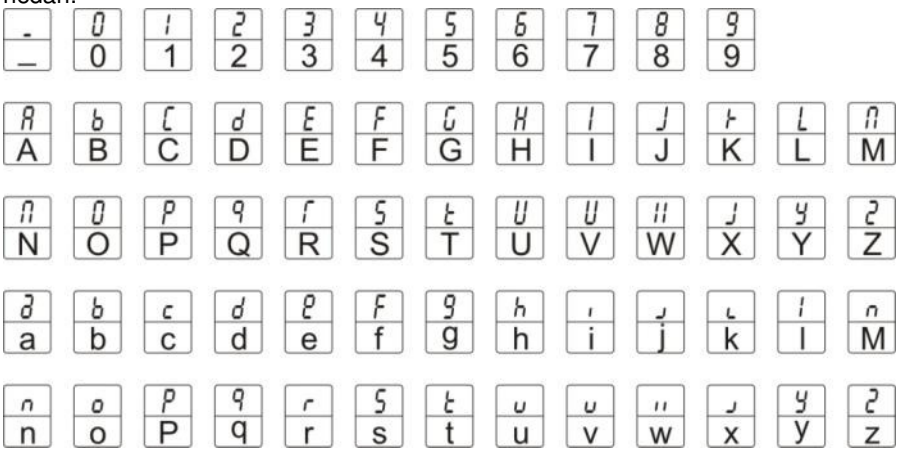
P2.1	USr	|	
P2.2	PrJ	|	
P2.3	Ptin	|	YES
P2.4	PdAt	|	YES
P2.5	PUSr	|	YES
P2.6	PPrJ	|	YES
P2.7	PId	|	YES
P2.8	PFr	|	YES

- **P2-01 USr**

Möjliggör inskrivning av användarnamn. Namnet kan bestå av upp till 6 alfanumeriska tecken och skrivs in med hjälp av fuktanalysatorns tangentbord eller navigeringsknapparna **Up**, **Down**, **Left**, **Right**.



Tillgängliga tecken och motsvarande utseende på fuktanalysatorns display visas nedan:



Exempel på användarnamn inskrivet med versaler:

WILK

Exempel på användarnamn inskrivet med gemener:

wilk

- **P2-02 Prj**

Möjliggör inskrivning av projektnamn (t.ex. för ett specifikt prov).
Exempel på projektnamn inskrivet med versaler:

POLON

Exempel på projektnamn inskrivet med gemener:

polon

- **P2-03 Ptin**

Möjliggör utskrift av tidpunkten för mätningen

- **P2-04 PdAt**

Möjliggör utskrift av datum för mätningen

- **P2-05 PUSr**

Möjliggör utskrift av användarnamn

- **P2-06 PPrj**

Möjliggör utskrift av projektnamn

- **P2-7 Pld**

Möjliggör utskrift av tillverkningsnummer

- **P2-08 PFr**

Möjliggör utskrift av en ram runt data

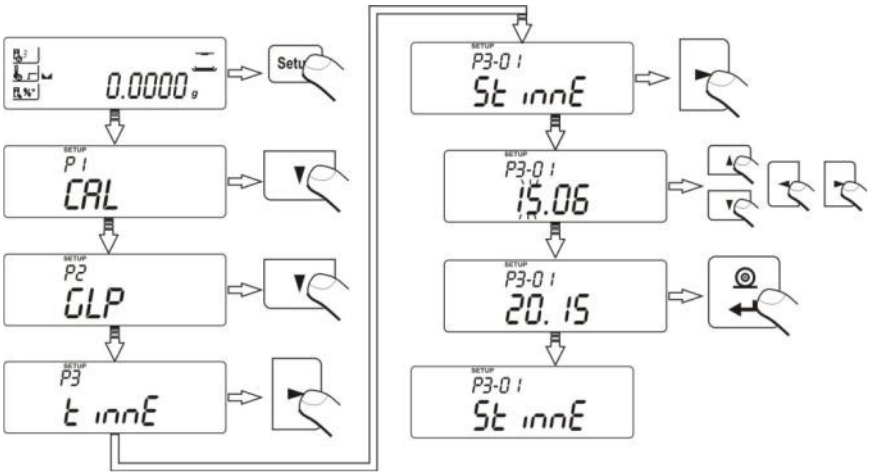
Välj värde för ovanstående parametrar:

no - ingår ej i utskriften,
YES - ingår i utskriften

Återgå till vägning
(se avsnitt 8,2 – återgå till vägninsfunktion).

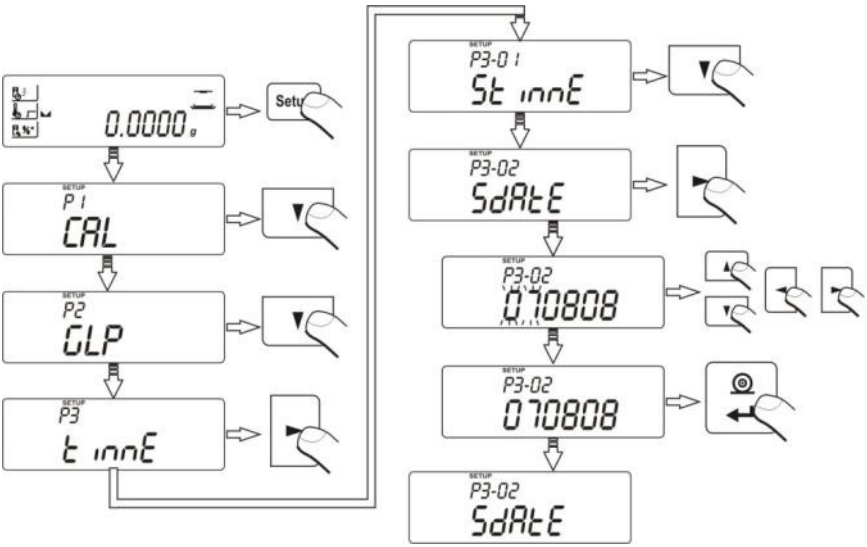
12. INSTÄLLNING AV TID OCH DATUM

12.1. Inställning av tid



Inställning av fuktanalysatorns interna klocka – inställningen sker med navigeringsknapparna **Up**, **Down**, **Left**, **Right**.

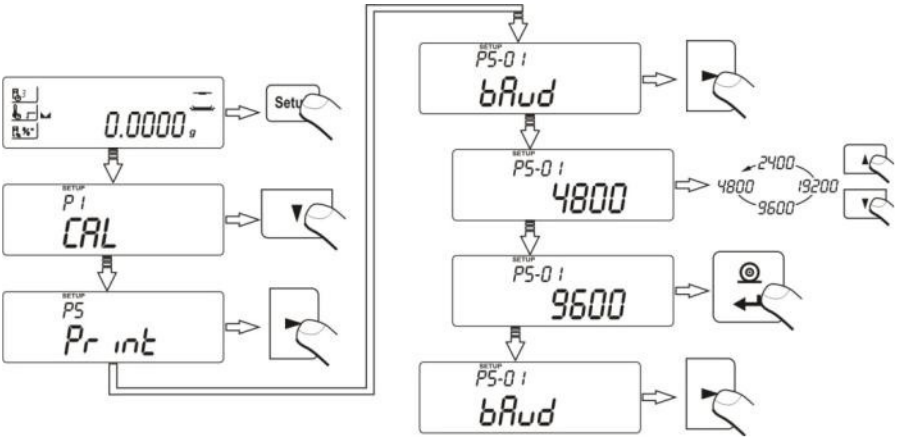
12.2. Inställning av datum



Inställning av fuktanalysatorns interna kalender – inställningen sker med navigeringsknapparna **Up**, **Down**, **Left**, **Right**.

13. FUNKTIONER I SAMBAND MED RS 232 SERIEKOMMUNIKATION

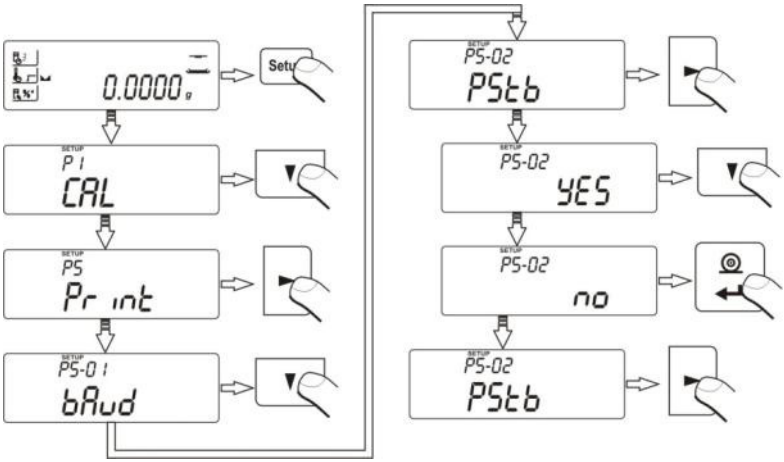
13.1. Inställning av överföringshastighet



Välj önskat värde (baud):
- 2 400 bit/s
- 4 800 bit/s
- 9 600 bit/s
- 19 200 bit/s.

Återgå till vägning
(se avsnitt 8,2 – återgå till vägninsfunktion).

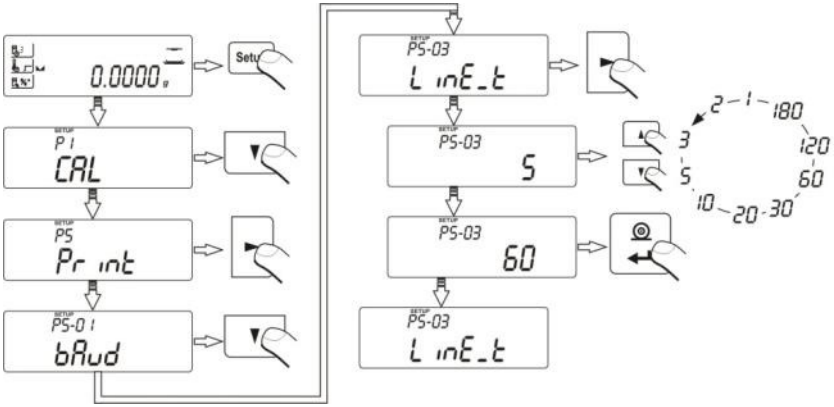
13.2. Val av datatyp som skall sändas via RS 232



YES - sändning av stabil vikt,
no - sändning av stabil eller temporär vikt.

Återgå till vägning
(se avsnitt 8,2 – återgå till vägninsfunktion).

13.3. Utskriftintervall



Parametern avgör hur ofta information om torkprocessen skall sändas via RS 232. Möjliga intervall: **1**, **2**, **3**, **5**, **10**, **20**, **30**, **60**, **120**, **180** sekunder.

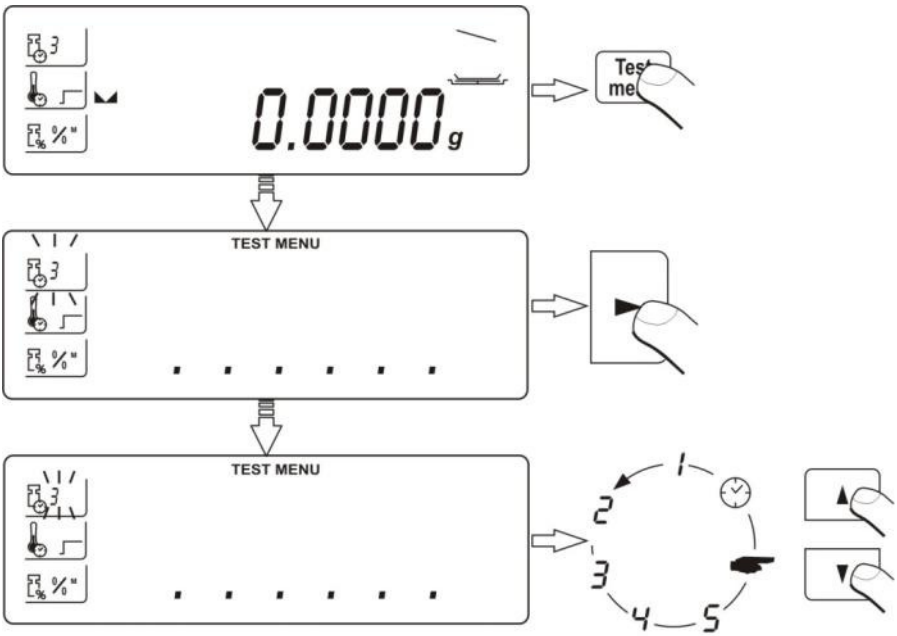
14. TORKPROCESS MED ANVÄNDNING AV KORT MENY

Följande procedurer skall ställas in under menyn för torkprocessen:
- metod för torkprocessens avslutande,
- profil för torkprocessen,
- typ av visat resultat.

Torkprocessen startas med kort meny genom att öppna programbiblioteket – **P6-01 Libr**.

Parametrarna ändras genom att öppna torkmenyn med knappen **Test menu**. Gruppekaren **way of drying process finish** blinkar då. Ställ in parametrarna med navigeringsknappen **Right**. Välj alternativ med navigeringsknapparna **Up** och **Down.** Ställ in alternativen och bekräfta ändringarna (tryck två gånger på knappen **Print**/**Enter**) eller fortsätt ställa in parametrarna (tryck en gång på knappen **Print**/**Enter**).

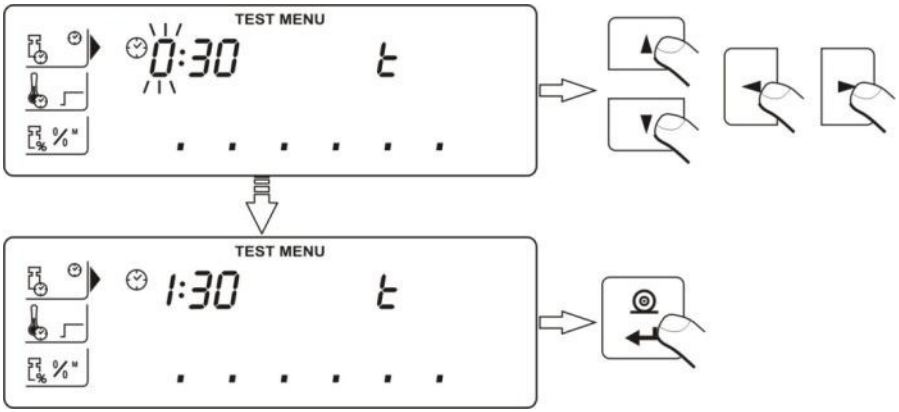
14.1. Metod för torkprocessens avslutande



Följande alternativ kan väljas:

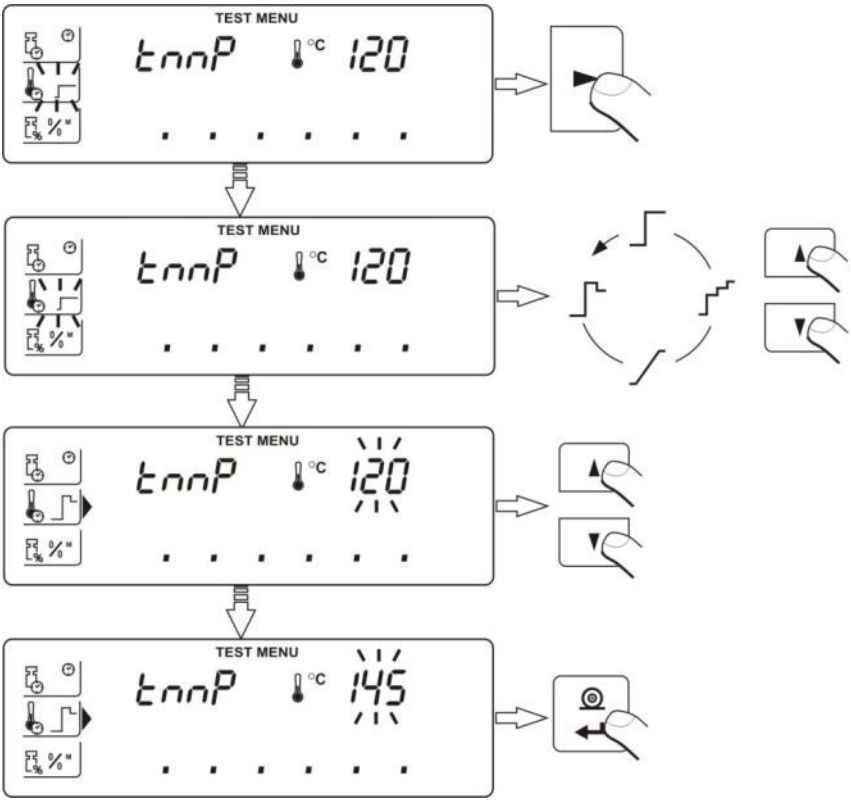
1 - automatisk avslutning (massan ändras 1 mg per 20 sekunder)
2 - automatisk avslutning (massan ändras 1 mg per 50 sekunder)
3 - automatisk avslutning (massan ändras 1 mg per 120 sekunder
4 - automatisk avslutning (massan ändras 1 mg per 180 sekunder)
5 - automatisk avslutning (massan ändras 1 mg per 240 sekunder)
- manuell avslutning (genom intryckning av knappen **Start**/**Stop**)

- tid till avslutning (max tid 9 timmar 59 minuter):



Ändringarna bekräftas genom att trycka tre gånger på knappen **Print**/**Enter**.

14.2. Profil för torkprocessen



Ändringarna bekräftas genom att trycka tre gånger på knappen **Print**/**Enter**.

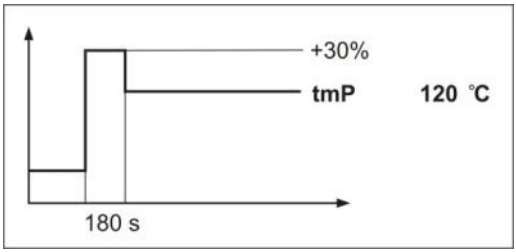
Parametern **profil för torkprocessen** kan väljas enligt följande:

- **STANDARD torkprofil**

Standardprofilen använder den inställda temperaturen **tmP** för provet,

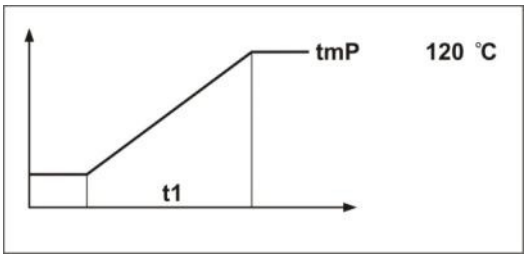
- **SNABB** torkprofil

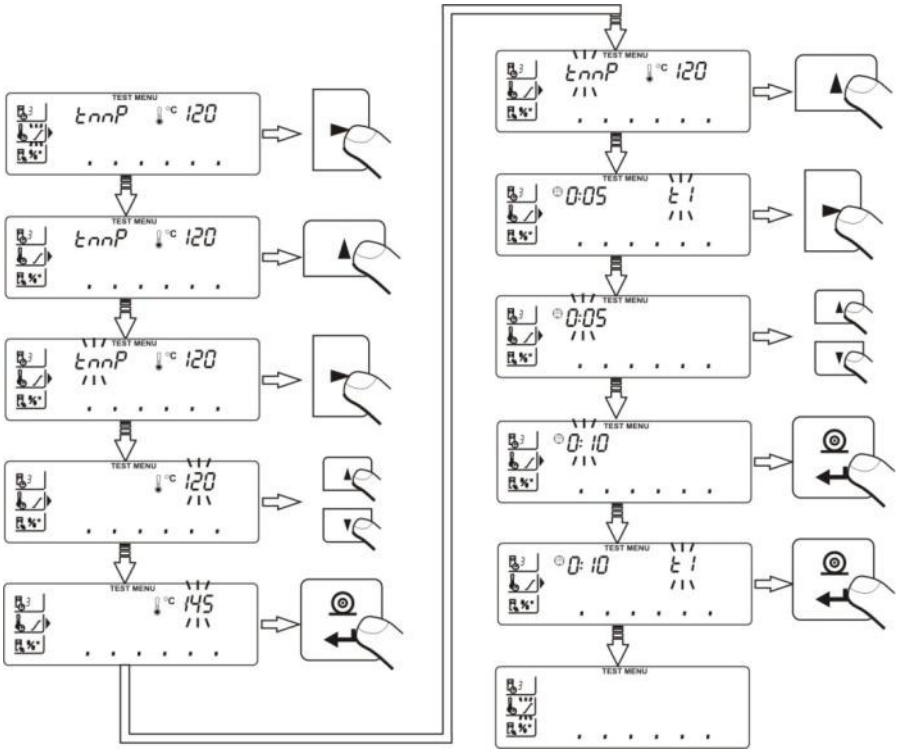
Den snabba profilen använder den inställda temperaturen **tmP** för provet,
Profilen karakteriseras av en snabb temperaturhöjning under relativt kort tid. Torktemperaturen höjs 30 % under 180 sekunder varefter temperaturen sjunker till den inställda.



- **MILD** torkprofil

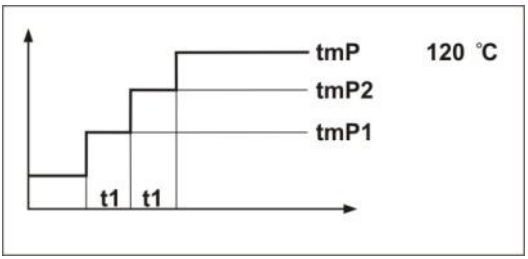
Den milda profilen använder den inställda temperaturen **tmP** för provet och tiden **t1** då fuktanalysatorn skall nå denna temperatur.

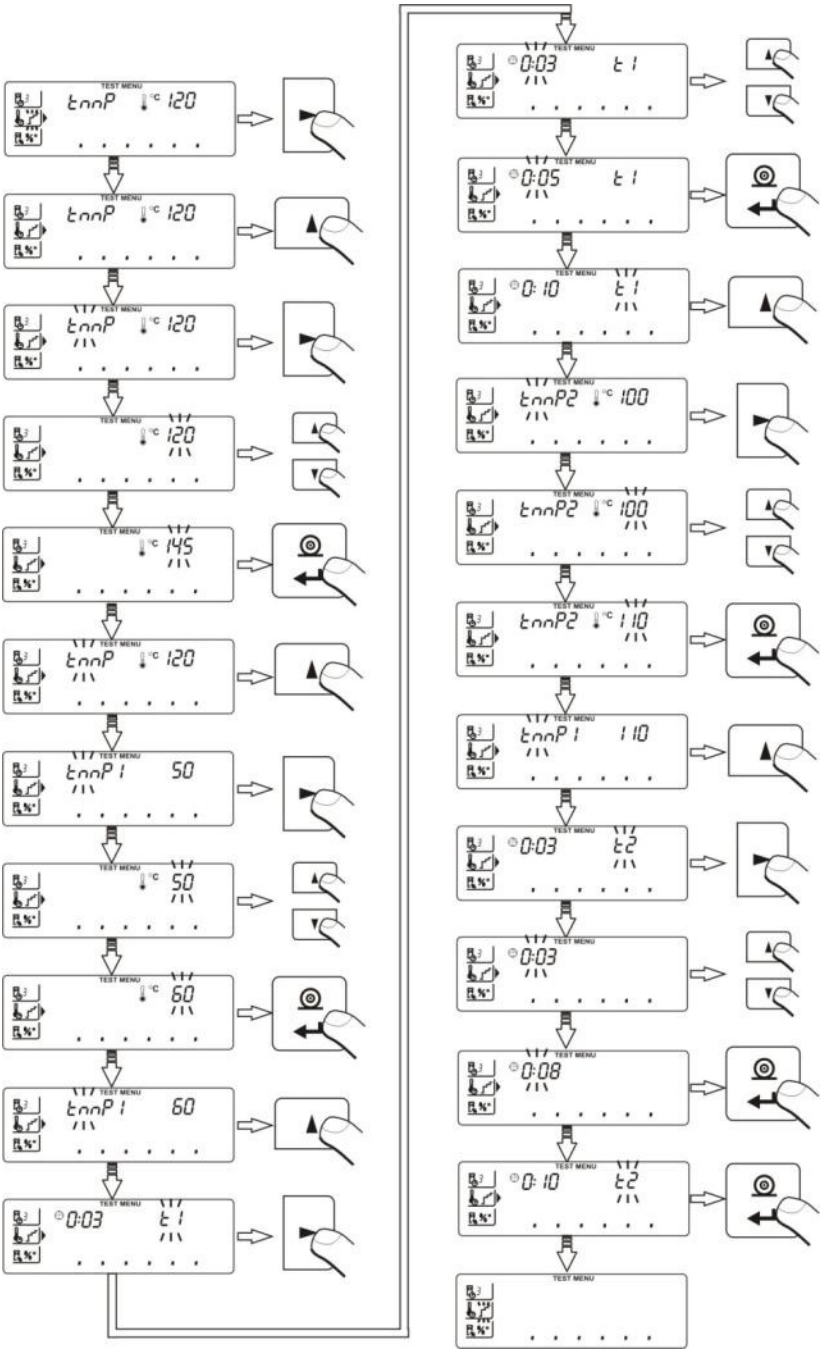




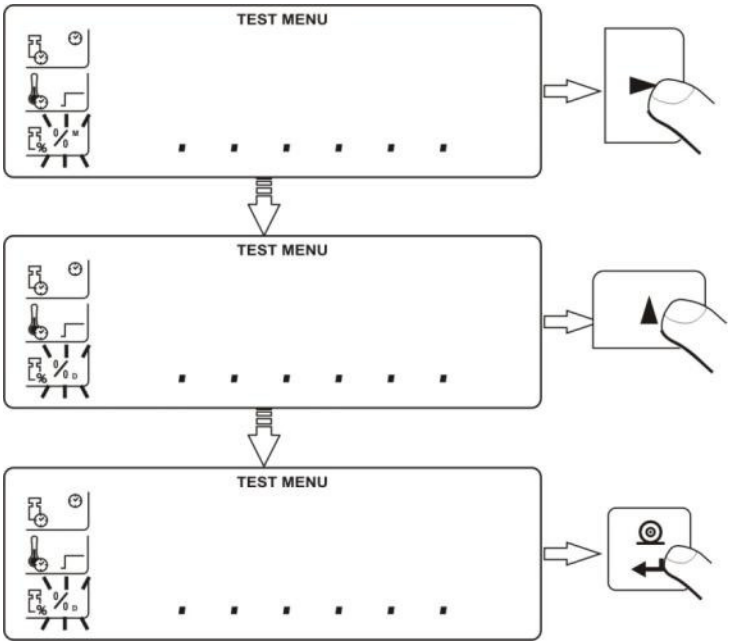
- **STEG-**profil

I stegprofilen används temperaturen **tmP** för provet tillsammans med stegtemperaturerna **tmP1** och **tmP2** samt tiderna mellan stegtemperaturerna **t1** och **t2**.




TEST MENU
tmnP 120
tmnP 120
tmnP 120
120
145
tmnP 120
tmnP1 50
50
60
tmnP1 60
0:03 t1
0:05 t1
0:10 t1
tmnP2 100
tmnP2 100
tmnP2 110
tmnP1 110
0:03 t2
0:03
0:08
0:10 t2

14.3. Typ av visat resultat



Ändringarna bekräftas genom att trycka tre gånger på knappen **Print**/**Enter**.

- viktförlust i procent

$\%_{0}^{M}$

ändring av registrerad massa under torkprocessen uttryckt i procent,

- torr massa efter torkprocessen uttryckt i procent,

$\%_{0\ D}$

på vågskålen kvarvarande massa efter avsluta evaporering av fukten,

- förhållandet mellan fuktig och torr massa uttryckt i procent

$\%_{0}^{R}$

den under torkprocessen evaporerade fukten,

- förändring av massa

g

massans förändring under torkprocessen.

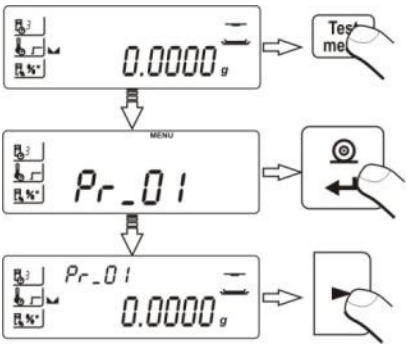
15. TORKPROCESS MED PROCEDURER I PROGRAMBIBLIOTEKEN

En torkprocess med användning av procedurerna i programbiblioteken startas genom att öppna biblioteken **P6-01 Libr**. Fuktanalysatorn har 20 bibliotek vilka kan konfigureras individuellt, sparas och användas för provningen.

Parametrarna ändras genom att öppna torkmenyn med knappen **Test menu**. Gruppekaren **way of drying process finish** blinkar då. Ställ in parametrarna med navigeringsknappen **Right**. Välj alternativ med navigeringsknapparna **Up** och **Down.** Ställ in alternativen och bekräfta ändringarna (tryck två gånger på knappen **Print**/**Enter**) eller fortsätt ställa in parametrarna (tryck en gång på knappen **Print**/**Enter**).

Följ proceduren i **avsnitt 14 TORKPROCESS MED ANVÄNDNING AV KORT MENY** för inställning av parametrarna.

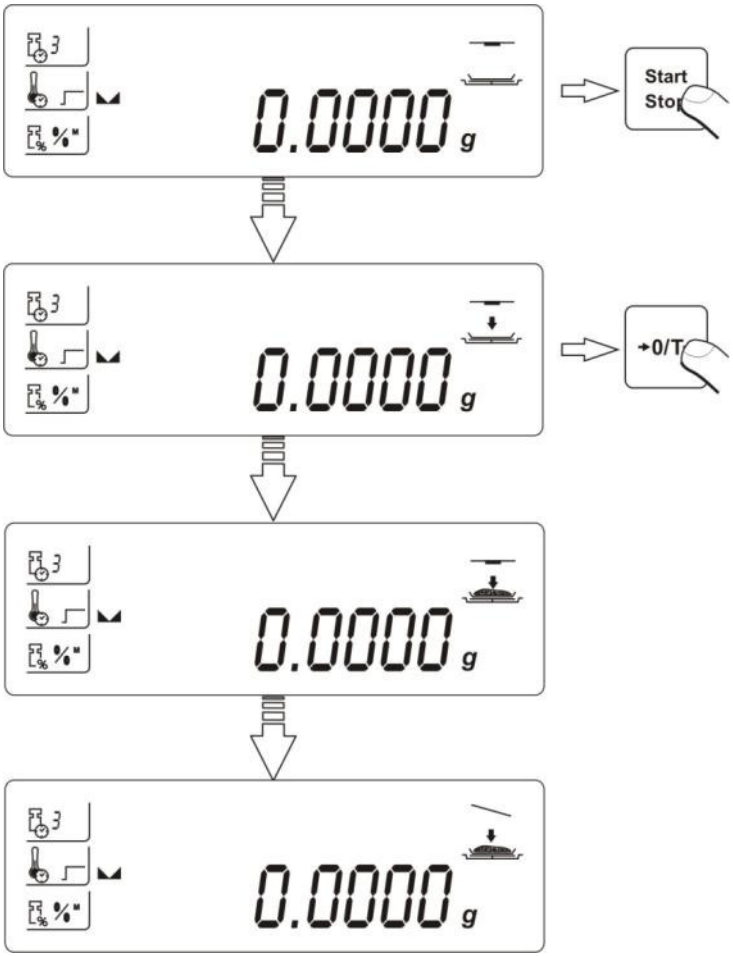
Uppkallning av ett specifikt bibliotek för torkprocessen:



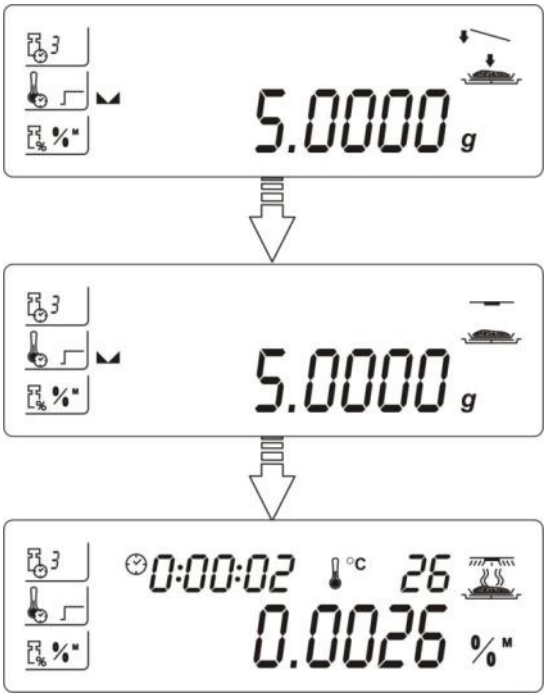
Se **avsnitt 10.3** för att avbryta användande av programbiblioteken.

16. TORKPROCESS

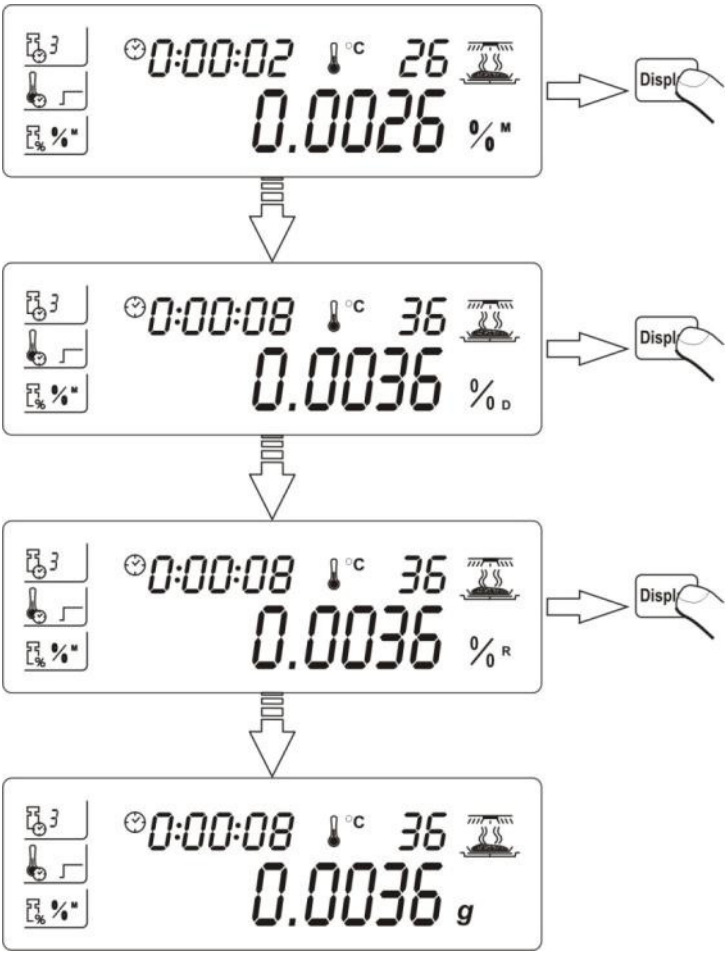
Start av torkprocessen:



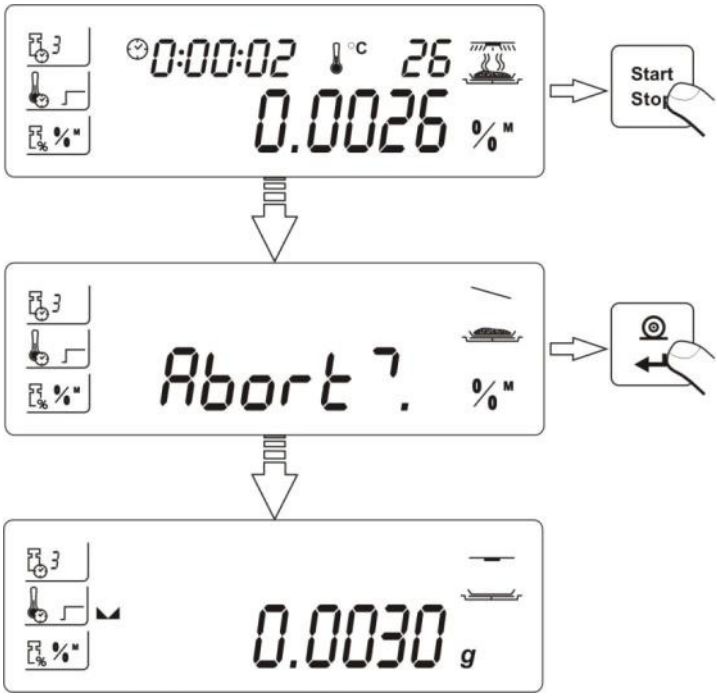
Torkprocessen startas genom intryckning av knappen **Start**/**Stop** och, sedan vågskålen tömts, knappen **TARA.** Öppna torkkammaren, placera provmaterialet på kammarens skål och stäng kammaren.



De olika skärmarna bläddras fram med knappen **Display**.



Torkprocessen avbryts genom att trycka in knappen **Start**/**Stop** och bekräfta med **Print**/**Enter**. Alternativt kan torkanalysatorn själv avsluta processen genom att trycka endast på **Start**/**Stop.** Analysatorn fullbordar torkprocessen och avbryter därefter processen utan intryckning av knappen **Print**/**Enter**.



Number of instruction:
LMI 23/03/06/08/ENG

MANUFACTURER
OF ELECTRONIC WEIGHING INSTRUMENTS

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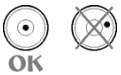
phone/fax. + 48 48 385 00 10
Sales Department + 48 48 366 80 06
www.radwag.com

DIN EN ISO 9001:2000
CERTYFIKAT Nr 71 100 C206

”Lathund” för uppstart av vattenhaltsvåg MACxxx för spannmål.

Introduktion:

Vågens uppställning i plant läge före igångsättning beskrives i manual kapitel 4.3 .



Efter strömpåslag visas en symbol på display likt ett V-block, att plan uppställning är OK.

Vid leverans är vågen inställd på ett defaultprogram för fukthetsmätning, som blir aktivt vid strömpåslag.
I displayen till vänster visas tre symboler med inställda funktioner.

- Automatiskt stopp ”3”.Vid en uppnådd torrhetsförändring i provet mindre än 1 mg / 120 sek
- Torktemperatur av 120°C. Vid ”standard” torkprofil uppnås 120° efter c:a 2 min
- Vattenhalts % såsom borttorkad vikt

Denna inställning går att använda direkt för vattenhaltsprovning av spannmål. Parametrarna ger korrekt resultat, men tiden för processen är ganska lång.

Torktemperatur:
En etablerad provtagningsprocess beskrivs i ICC-standard #110/1.
Torktemperatur anges där till 130 – 133°C.
På vissa anläggningar torkas proverna i ugn (130°) i 1 timma.
MAC- vattenhaltsvåg kan också göra detta eller beträffande torktiden enligt optimala villkor.

Provmängd och preparering:
Lämplig provmängd är 6 – 10 gram. Provet skall vara relativt finmalet i typ kaffekvarn.
Eftersom provmängden är liten, kan en manuell ”gammal” kaffekvarn vara en fördel. Exempelvis kan ”rutinmässigt” 10 varv på kvarnens vev alltid ge lämplig provmängd, och allt som malts kan därefter läggas i provskålen.

Inställning av MAC- vattenhaltsvåg för spannmål.

Vågens handhavande kan ske på två sätt och kräver vissa ändringar.

1) Ändring av defaultvärde för torktemperatur från 120°C till 130 – 133 °C.

För att följa ICC-standard eller använda egna data, måste man förändra vågens grundinställning. Dessa värden raderas dock vid strömavbrott, och måste således uppdateras på nytt vid återanvändning.
Inställda värden raderas **ej** vid avstängning med strömbrytare på vågen.

2) Användning av program för egna värden av torktemperatur och torktidsparametrar.

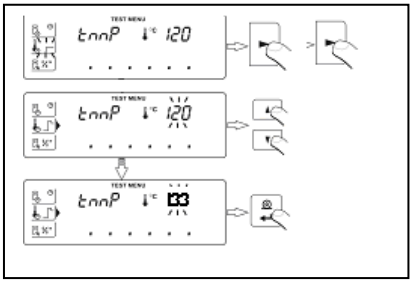
Det finns 20 st programplatser, som kan ges egna värden. Det är dock troligt att enbart ett program ”Pr_01” uppdateras/sparas och används av provtagaren.
För att använda program måste detta anges i ”SETUP”- meny ”P6-01” som ”YES”.
Se avsnitt 9.3.

Följande 2 sidor beskriver handhavande för metod 1) resp. 2)

Bilaga: Prov – vete MAC
Resultat av ett test med två olika torktidsparametrar och olika provmängder utfaller.

" 1) " Snabbast att starta upp!
Ändra bara torktemperatur till 133°C – kör sedan efter "Lathund"!

Ändra standardvärdet på temperatur i vågen från 120° till 133° :
(Resten är OK) Se 14.2 sidan 37 i manualen.



Testmenu

Neråt (till temprutan som blinkar)

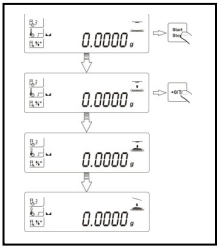
Höger→

Höger → ("120" blinkar)

Uppåt ↑ upprepat tills 133° står som värde
Enter
Enter
Enter

****

"Lathund" för torkning- vattenhaltsmätning

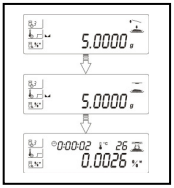


Se 16 sidan 43

Tom behållare placerad i vågen

Tryck Start

Tryck →0/T (tara)



Ta ut behållare och fyll i mald provmängden 6-10 gram

Placera tillbaka behållare i vågen (Provmängd visas)

Stäng lock = självstart

Vid färdigtorkat prov står det END i displayen och vattenhalts% avläses.

****

För nytt prov öppnas locket och behållaren tömmes noggrant och placeras åter i vågen……..

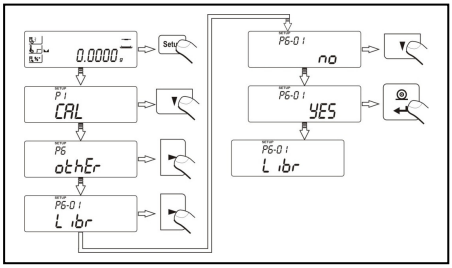
****

För att avbryta ett startat prov: Tryck Stop ='Abort?' blinkar Tryck Enter

****

”2)” Gör program för temperatur och torktidsparametrar

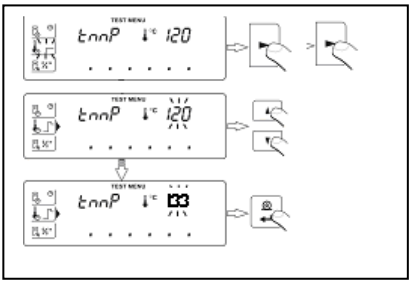
Gå in i ”SETUP” för att ange att ”program” ska vara aktivt. Se kap. 9.3



etup
Neråt till ”P6 other”
Höger ”Libr”
Höger ”NO” blinkar
Neråt ”YES” blinkar
Enter “P6-01 Libr” visas
ESC
ESC Save?
Enter

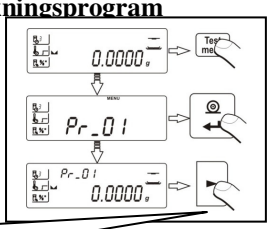
Ändra temperatur till 133°C i program Pr_01 (poppar upp först vid uppstart)

Testmenu – Pr_01 visas (ska ett annat programnr ändras – pil uppåt eller neråt)
Enter
Höger ”Tidssymbol blinkar”
Neråt ”Tempsymbol blinkar”
Höger
Höger ”120 blinkar”
Uppåt upprepat till ”133”
Enter
Enter
Enter
Enter



Börja här när strömmen varit bruten eller ett speciellt torkningsprogram skall väljas.
Se 15 sidan 42

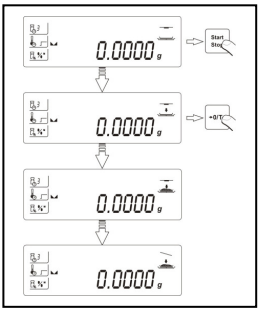
Test menu
Pr_01 visas (Uppåt eller neråt om annat program önskas)
Enter (följ nu ”Lathund”)



Tryck Höger om ändringar ska göras i valt program

****

”Lathund” för torkning- vattenhaltsmätning
För torkprocessen se kap 16 sidan 43



Används samma program hela tiden utan strömavbrott, startas processen alltid här!

Tom behållare placerad i vågen

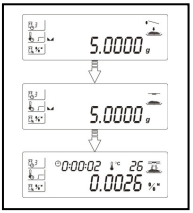
Tryck Start

Tryck →0/T (tara)

Ta ut behållare och fyll i mald provmängden 6-10 gram

Placera tillbaka behållare i vågen (Provmängd visas)

Stäng lock = självstart



Vid färdigtorkat prov står det END i displayen och vattenhalts% avläses.

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För nytt prov öppnas locket och behållaren tömmes noggrant och placeras åter i vågen……..