

Operating Manual

Precision Balances

CY/CG Series



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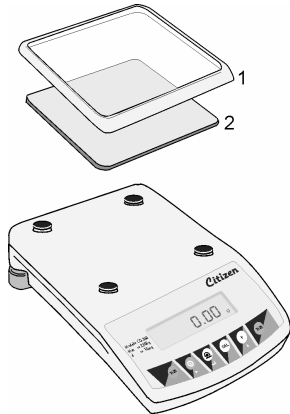
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1. SETTING UP THE BALANCE

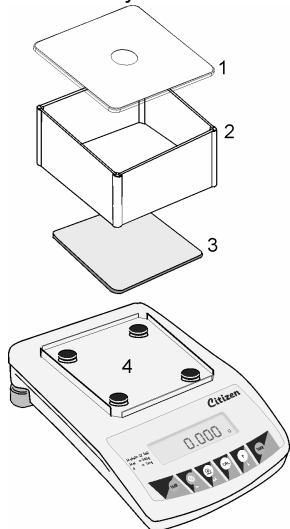
Cut safety tape off. Take balance off the box. Take all necessary to correct performance of balance elements off the box. After replace balance in place of use put scale and rest of elements on.

Assembly of elements for scale with precision 10mg:



- Put pan scale (2) on gum mandrels
- Put cover on scale (1) using pins in back part of balance cover.
- After assembly check if scale touches gum mandrels
- Turn power supply on
plug in feeder to socket at back of balance casing
- Display shows digits (test of display) and then display shows 0.00g
- If indication is not zero press tare key

Assembly elements for scale with precision 1mg:



- Put pan scale (3) on gum mandrels
- Put glass shield on scale (2) using masking frame which is on balance cover (4), (scale masking frame must be inside of scale)
- Put upper cover on cover of scale
- After assembly check if scale touches gum mandrels
- Turn power supply on, plug in feeder to socket at back of balance casing
- Display shows digits (test of display) and then display shows 0.000g
- If display doesn't show zero press tara key

2. APPLICATION

Electronic scale **CY - CG** is appropriate for precise measurements mass in laboratory conditions with possibility of setting to zero in all measure range. Balance calibration is done by **CAL** on balance keyboard.

Functions accessible to user are divided into 4 parts:

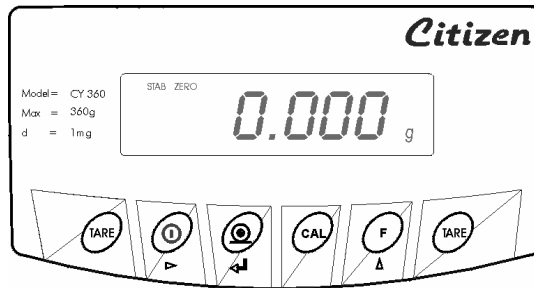
- ✓ **Functions for weighing units (press F key)**
 - Weighing in grams,
 - Result with 3 places after dot,
 - Weighing in carats [ct],
 - Weighing in units from beyond **SI**: [GN], [mom], [oz], [dwt]. Access to these units is blocked from factory menu level.
- ✓ **Functions for calibration and weighing modes (tare key + f key)**
 - Summing function
 - Counting pieces
 - Control of deviations % according to standard mass
 - Thickness of liquids
 - Thickness of solids
- ✓ **Choice of criteria of stable result depending on conditions of using (tare key + cal key)**
 - Turn off/on system of autozero
 - Summing function
 - Turn off / on automatic calibration in relation to changes of temperature
 - Turn off/ on automatic calibration in relation to time from last calibration
 - Setting amount of average measurements
 - Average result of weighing
 - Adjusting balance for dosage procedure
 - Select default unit of weighing
- ✓ **Function for using RS 232 (tare key + print key)**
 - Choose speed of transmission
 - Define sent data as: stable / not stable
 - Continuous work
 - Setting data as additional element of parameter in printouts
 - turn on/off marking of last digit in printout

Moreover balance can be used to weigh hang loads, print report of calibration, check deviation of calibration and print reports of testing thickness of liquids and solids.

3. CONDITIONS OF APPROPRIATE USING

- scales should be used and stored in rooms without vibrations and shakes, without drafts and dust
- temperature of air should be $+15^{\circ}\text{C} \div +35^{\circ}\text{C}$
- during using balances changes of temperature shouldn't be higher than $0,5^{\circ}\text{C}$ per one hour
- scales should be replaced on wall console or stable table, far from sources of heating
- strong magnet is installed inside of balance – so it's important to be careful during weighing magnetic materials. Use hang loads if it's possible not to expose magnetic load to magnet influence. Suspension is replaced on basis of the balance.
- If static electricity has influence on scale annunciators it's necessary to connect it to earth. Earth screw is replaced in back part of balance base.
- Scale should be replaced in horizontal level to assure precision of weighing

4. KEYBOARD



Key **ON/OFF** is to turn display off. Others subassemblies are still supplying and scale is in stage of waiting for further work. If user press this once again weighing stage with measure units are displayed.



PRINT key is to send current state of display to external mechanism by connector RS 232



CAL key is to calibrate. It's manual calibration. After press if scale starts calibration. There shouldn't be any load on scale. If you press **TARE** during calibration calibration stops and weighing returns



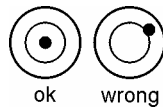
F is function key. It's to choose measure unit (in which measurement is done) or to change some functions in user menu



TARE key is to sett indication to zero. After setting to zero indication is zero. If load is taken off scale display show its mass with "minus" sign. Setting to zero can be done in all measure range of scale

5. START AND SERVICE

Before supply is turn on glass of weighing chamber should be draw



Balance should be leveled. To level scale screw legs in order air bubble was in centre position.

TIME OF HEATING

It's necessary to wait untill scale gets heat stabilization. It's time of own heating. User has to wait 15 min. in case of analytical scales.

Given values refers to scales that were in temperature of conditions of work before they are connected to suppling net.

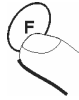
If scales were in much lower temperature (f.eg. in winter) time of acclimatization and heating is 4 hours before connect to supply net. During warm stabilization of scale indications on display can change.

After time of warm stabilization press **TARE** key – zero indication of mass appears on display and orders **Stab** and **Zero**. Balance is ready to weighing. If display doesn't show zero stage press **TARE** once again.

6. WEIGHING

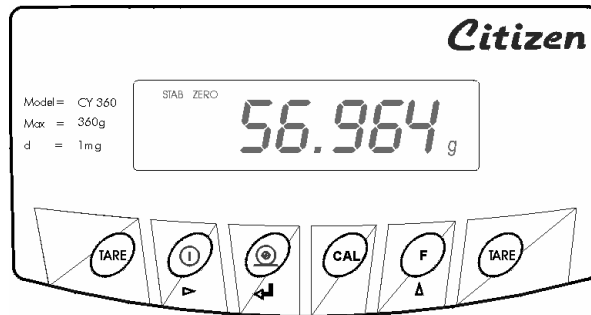
Before weighing or if the conditions of work changes (f.eg. if temperature of surrounding is higher then 3°C) scale should be calibrated according to way in point 7.

- Scale should be load few times by mass close to max capacity befor measurements
- Check if not load scale shows „precise zero” - **ZERO** if measurement is stable - order **STAB**, if not press key **TARE**,
- by means of **F** key sett measure unit



g, ct, and if they are accessible in factory menu GN, mom, oz, dwt,

- put load on scale and read result on display



- indication can be setting to zero many times by pressing key **TARE** (summary of mass loads recorded to scale memory cannot be bigger then its max capacity)



Don't turn off scale from supply power between following measurements. Turn scale off by key **ON / OFF**. If user press key **ON/OFF** once again scale is ready to following measurements.

7. CALIBRATION

To assure very precise weighing introduce correction factor to balance memory – **it's calibration**. Scales have system of internal calibration (calibration mass with all automatic system is built inside of scale)

Balances CG and CY can have:

- system of internal calibration (calibration mass with automatic system is installed inside of balance) - option
- System of external calibration (calibration is done by external weight)

Calibration should be made if:

- we start weighing
- there are long breaks between following measurements
- temperature of surrounding changes not more than 3 °C

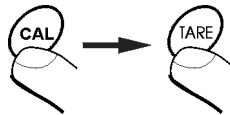


During calibration platform of balance cannot be loaded.

If there is load on platform order **unLoad** appears on display. This is command to take load off platform.

Calibration can be stopped if it's necessary.

To stop calibration press key **TARE** after pressing key **CAL**.



7.1. Balance with external calibration

Pressing key **CAL** causes calibration of balance
- on display appears:



NO CAL

(balance starts autotest for calibration –during test you cannot load the scale), and then order

LOAD

(it is command to put calibration mass on scale) calibration mass is given in grams.
If you the mass on scale on display appears

-- CAL --

calibration and then

UNLOAD

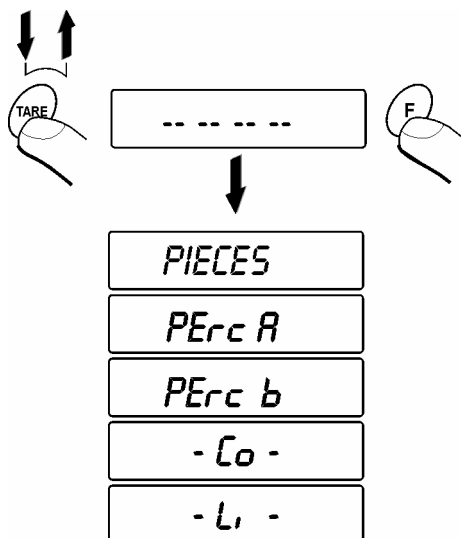
take calibration mass off scale. After take calibration weight off scale balance shows zero. If unsuitable load is put on scale – balance displays

CAL ER (calibration is cancelled)

8. SCHEDULE OF ENTERS IN SETTING FUNCTIONS

- Counting pieces
- Control of deviations % according to standard mass
- Thickness of liquids
- Thickness of solids

Press **TARE** key (scale shouldn't display STAB). If horizontal lines appears on display press key **F**

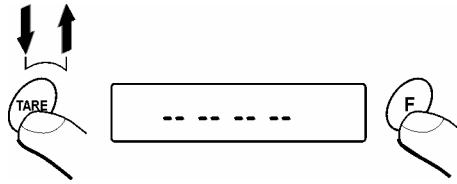


After pressing key **F** name of first approachable function appears. Every next pressing key **F** makes names of following approachable functions appear on display. Way of setting functions is described in further part of instruction.

8.1. Counting pieces

Software enables to amount small elements with the same mass To use this function:

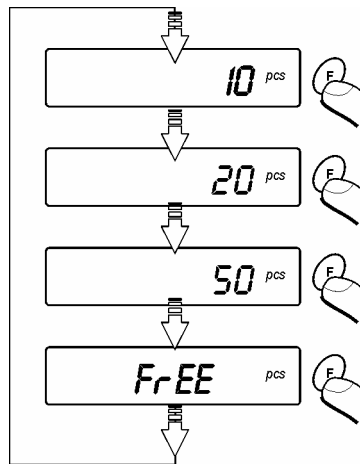
- put package on scale and press **TARE** its mass to balance memory
- press key **TARE**. When horizontal lines appear on display press key **F**



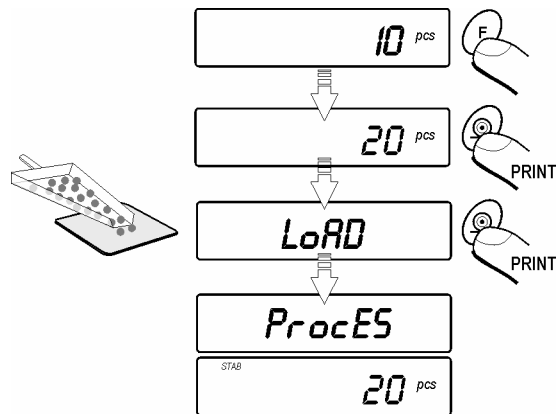
- Press **F** key – display appear

PIECES

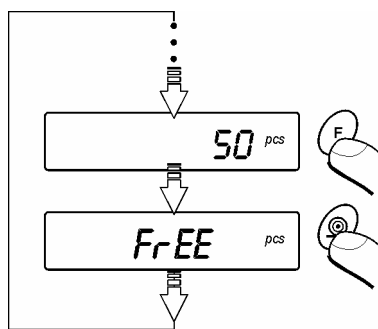
- Press **PRINT** key to activate function (you can select from 10, 20, 50pcs or free definable)



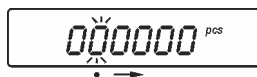
- Press **F** key – choose value
- If you want to start the counting pieces function, please choose one of the values, eg. 20 pcs



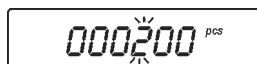
- After displaying of LoAd information, please put on the pan of the balance as many pieces as have been chosen (20pcs).
- If option Free was chosen, the display will show the number of pieces with flashing of the first digit – you should inscribe as many pieces are in the mass pattern



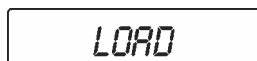
- set up batch quantity by means of keys
ON/OFF – choose digit



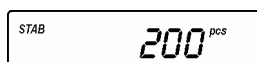
- **F** – choose value



- confirm by pressing key **PRINT** -
LOAD appears on display



- after making sure that batch with declared quantity is put on scale
confirm by key **PRINT** once again - balance displays
Process, and then amount of elements and **PCS**.



- after adding or take counted elements off scale their amount appear on display

Return to weighing mode

- press key **F** many times until - **PIECES** appears on display

PIECES



TARE

F

- press **TARE** key

Balance return to weighing mode and diode with **g** mark starts flashing

STAB 29.30_g

Attention:

- If you choose batch quantity remember that precision of counting depends on metrological parameters of balance and on repeatability of mass singular counted elements.*
- Result of measurement is more precise if batch quantity is bigger*
- If summary mass of batch quantity is less than 5 reading divisions (5d) – balance shows order about error **-LO-** and return to weighing automatically.*

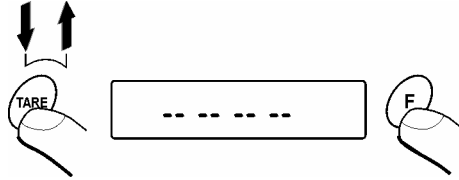
8.2. Control of deviations % according to standard mass

Software enables control of deviations (in %) mass of weighed loads from standard mass. Standard mass can be defined by weighing (function **PERC A**) or written to balance memory by user (function **PERC B**)

8.2.1. Standard mass defined by its weighing

Procedure:

Press key **TARE**. When horizontal lines appear on display press **F**



- Press key **F** many times until on display appear

PERc A

- press key **PRINT** to active function
- on display appears:

LOAD

- put load on scale. Mass of this load is assumed as standard
- press **PRINT** to confirm this work mode
- on display appears **Process** and after few seconds **100,00%**

STAB **100.00 %**

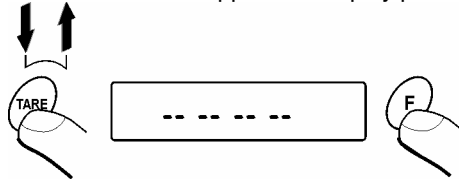
From this time instead of mass weighed load relation load on scale to standard mass is displayed. (in %).

STAB **65.26 %**

8.2.2. Standard mass introduced to balance memory by user

Procedure

Press key **TARE**. When horizontal line appear on display press key **F**



- Press key **F** many times until - **PERC B**
- Appears on display

PERC b

- press **PRINT** key to activate this function
- on display appears:

000000 g

- by means of keys:

ON/OFF – choose digit,

000000 g

F - choose value of digit

006250 g

set value of standard mass and write it in balance memory by means of key **PRINT** – on display appears: **0,00 %**

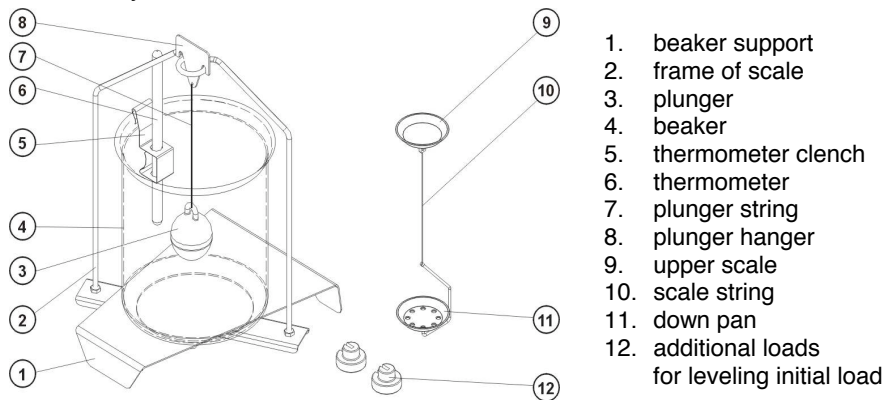
STAB ZERO 0.00 %

From this time relation of load on scale to standard mass (in%) is displayed instead of weighed load mass. Leave mode of percentage deviations from standard mass control

- Press key **TARE**. When horizontal lines appear on display press **F**. Press key **F** many times until **Perc A** or **Perc B** appears on display - press **TARE**,

8.3. Definition thickness of solids and liquids

There is equipment to defining thickness of solids and liquids in additional equipment. For user request Citizen service can render special software to define thickness by scale accessible.



8.3.1. Testing thickness solids

Thickness of solids can be tested in one of 3 liquids:

- H₂O (distilled water),
- C₂H₅OH (spirit 100% +/- 0.1% in temp. 20⁰C),
- AnotHEr (another liquid with known thickness)

Give temperature of liquid for distilled water and spirit. For liquid with known thickness value is written on keyboard.

To test thickness weigh sample on upper scale and weigh the same sample in liquid (on down scale). Result is represented on display automatically after replacing sample in liquid. After pressing key **PRINT** scale gives report from examination automatically.

8.3.2. Testing thickness of liquid

Basic element for measuring thickness of liquid is glass plunger. It has precise capacity shown on hook.

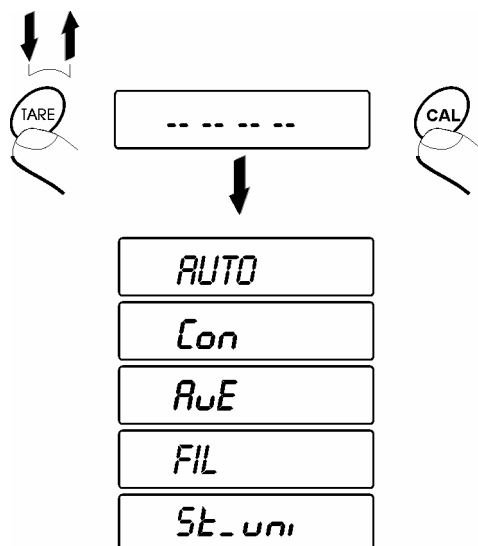
Before final measurements this value should be introduced to scale memory. To test thickness of liquid weigh glass plunger on upper scale and in tested liquid. Result of testing is shown on display automatically after introducing mass of plunger. After pressing key **PRINT** scale generates report from made examination automatically.



9. Adjusting the balance to working conditions

- Turn off/on system of autozero
- Speed of stabilization
- Average result of weighing
- Adjusting balance for dosage procedure
- Select default unit of weighing

Press **TARE** key (scale shouldn't display STAB). If horizontal lines appears on display press key **CAL**



After pressing key **F** name of first approachable function appears. Every next pressing key **F** makes names of following approachable functions appear on display. Way of setting functions is described in further part of instruction.

9.1. Turn on/off autozero system

Press key **TARE**. When horizontal lines appears on display press key **CAL**. Then press key **F** many times untill order **AUTO** appears on display. Press key **PRINT**

AUTO



- Current value for autozero function appears on display.

AUTO 0

- Press key **F** many times and sett value on 0 or 1 including following dependences:

AUTO 0 - autozero is turn **ON**

AUTO 1 - autozero is turn **OFF**



AUTO 1

- Press key **PRINT** to confirm setting.



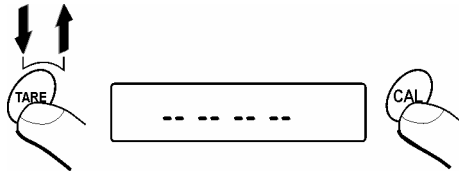
Notice: Remember that setting **AUTO 1** (autozero is turn off) refers to possibility of not stable result for not loaded scale.

For turn function on when scale is not load result of 0 is displayed. There are orders **STAB** and **ZERO** displayed in upper left corner.

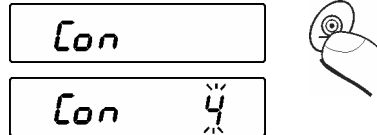
STAB ZERO 29.30 g

9.2. Choice of criteria of stable result depending on conditions of using

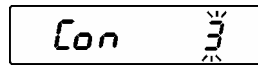
Press key **TARE**. When horizontal lines appears on display press key **CAL**.
Then press **F** key many times until order **Con** appears on display



- Press **PRINT** key. Next to **Con** settled value of parameter with flashing number is displayed. Flashing number means stage of average result



- By pressing key **F** change value of flashing number choosing one of the stages of averaging.



- Press **PRINT** key to confirm setting



If the conditions of work are good value **Con** should be settled on level 1÷2.
If the conditions are worse (drafts, breeze of air) set value on 5.

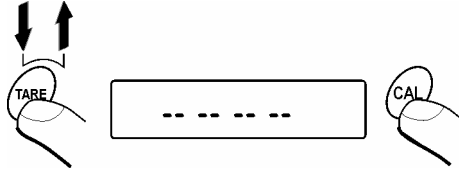
Notice:

*If user increases this parameter time of waiting for stable result is longer. If the conditions of work are bad and value **Con** are big scale cannot get stable result. But if value **Con** is too low for bad conditions scale doesn't get stable result (**STAB** lights on and off on display).*

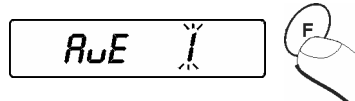
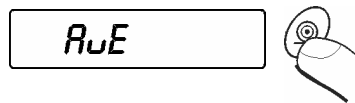
9.3. Average result of weighing

In various applications result of measurement is presented as average value of several measurements especially if the conditions are not stable (vibrations, twitches). In these cases if you use higher stage of the digital filter the measurement is done with the established precision.

Press the **TARE** button, when horizontal lines appear on the display press the **CAL** button.



- The balance shows first function in the menu. Press the **F** key repeatedly until command **AuE** appears on the display.
- Press the **PRINT** button



- Pressing the **F** button set up new value of the function **AuE** with complying following conditions:

AuE - 1 – average result I stage
AuE - 2 – average result II stage
AuE - 3 – average result III stage

- Confirm chosen value by pressing the **PRINT** button

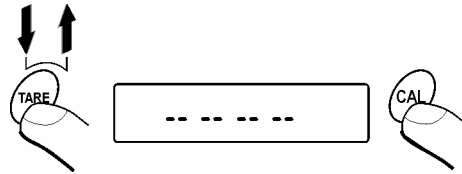


9.4. Adjusting scale for dosage procedures

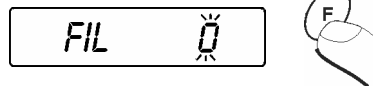
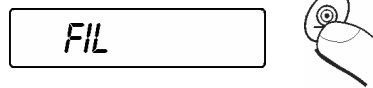
During dosage substances essential matter is fast reaction of the balance on mass increment. During this process digital filters must be turn off because they make reaction time longer although they help if any disturbances occur.

Procedure

Press the **TARE** button, when horizontal lines appear on the display press the **CAL** button



- The balance shows first function in the menu. Press the **F** key repeatedly until command **FIL** appears on the display.
- Press the **PRINT** button



- Pressing the **F** button sets up new value of the function **FIL** but comply with following conditions:

FIL	0	– understood value of the digital filters (recommended for weighing process)
FIL	1	– recommended for dosage, pouring, filling etc.

- Confirm chosen value by pressing the **PRINT** button

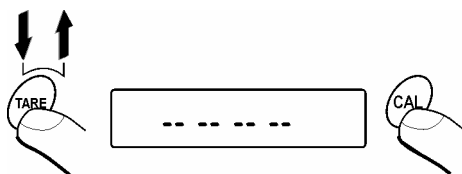


Attention:

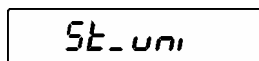
In the menu there is also function **AUTO** (autozero). This function controls zero point of the scales. User can turn it off before the dosage. The procedure of turn autozero off is included in the instruction manual.

9.5. Select default unit of weighing

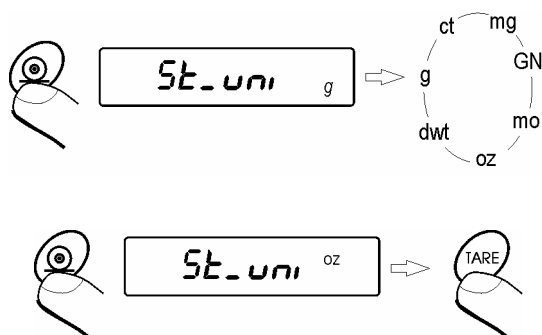
Press the **TARE** button, when horizontal lines appear on the display press the **CAL** button



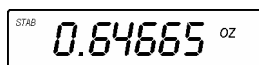
The balance shows first function in the menu. Press the **F** key repeatedly until command **St_uni** appears on the display.



Press **PRINT** button many times. The display will show units.



Press **TARE** key to confirm selected units.



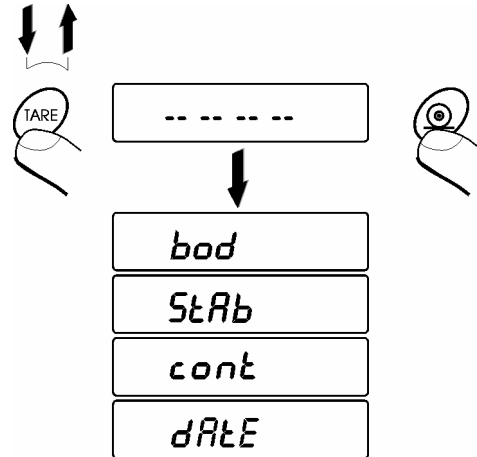
ATTENTION:

Default units will be show after switch on the balance

10. FUNCTIONS FOR USING RS 232

- Choose speed of transmission
- Define sent data as: stable / not stable
- Continuous work
- Setting data as additional element of parameter in printouts

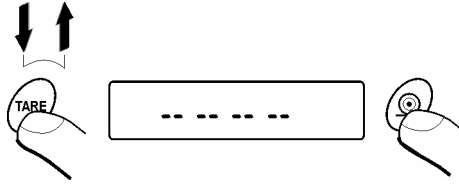
Press **TARE** key. When horizontal lines appear on display press key **PRINT**.



After pressing **PRINT** name of first approachable function appears. Every pressing of key **F** makes names of following approachable functions appear on the display. Way of setting functions is described in further part of instruction.

10.1. Choice of speed of transmission

Press key **TARE**. When horizontal lines appear on display press key **PRINT**.



Then press key **F** untill order **bod** appears on display. Press key **PRINT**.

bod

- Press **PRINT** key (diplay shows value for function BOD)

bod 5

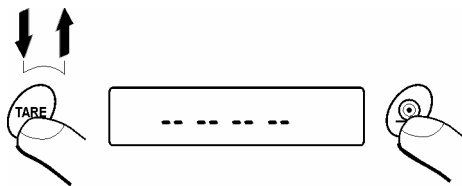
- press **F** key many times untill number of speed of transmission appears as below:

bod 1	- 300 bit / s,
bod 2	- 600 bit / s,
bod 3	- 1200 bit / s,
bod 4	- 2400 bit / s,
bod 5	- 4800 bit / s,
bod 6	- 9600 bit / s,

- confirm by pressing **PRINT**.

10.2. Definite sent data as stable/not stable

Press key **TARE**. When horizontal lines appear on display press key **PRINT**



- Then press key **F** many times until order **StAb** appears on display.



StAb

- by means of **PRINT** key start programming functions



StAb **0**

- by key **F** choose one of two values

STAB 0 – sending stable result of weighing
STAB 1 - sending temporary result of weighing

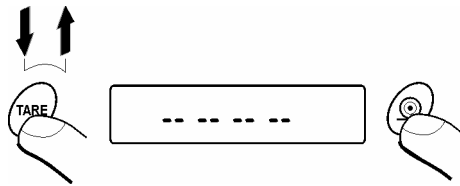


- confirm by pressing **PRINT**.



10.3. Continuous work (RS 232)

Press key **ZERO/TARE**. When horizontal lines appear on display press key **PRINT**.



- Then press key **F** many times until order **cont** appears on display.

cont

- Press key **PRINT**, current value appears on display

cont 0

- by key **F** choose one of two values

CONT 0 - lack of constance trasmission
CONT 1 - constant transmission

- confirm by key **PRINT**



10.4. Set-up date as basic parameter of printout

Signal (equivalent for state of display) is sent to printer by scale has form:

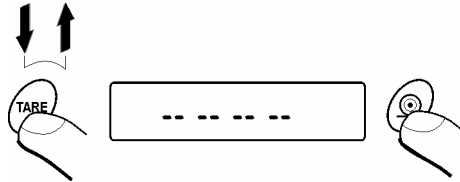
+ 123.456 g <CR><LF> (16 signs in general)

There is possibility of sending data in increased form f.eg.:

DATE 1998.09.21 TIME 09:51 + 100.001 g

Printing results of measurements in increased form is possible only with printer CITIZEN CPR02

Press key **TARE**. When horizontal lines appear on display press key **PRINT**.



- Then press key **F** many times untill order **dAtE** appears on display.

dAtE

- By means of key **PRINT** start programming functions

dAtE 0

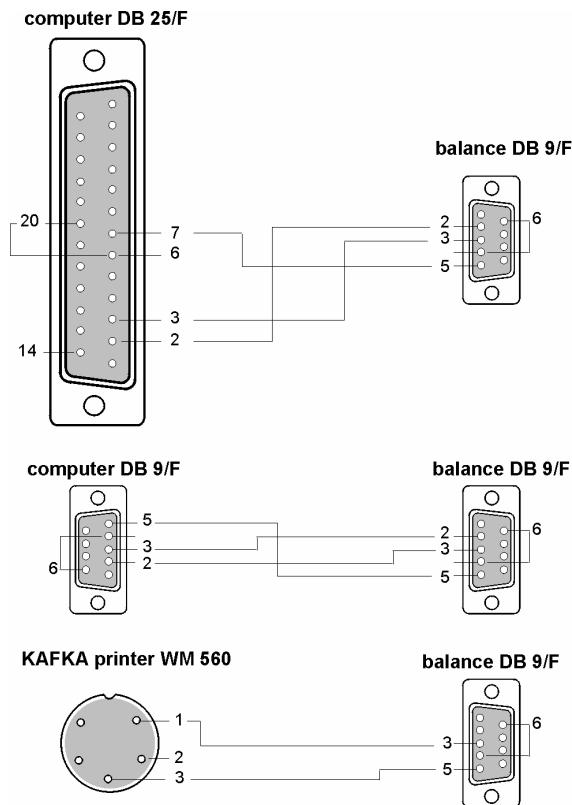
- by means of key **F** choose one of two values
dAtE 0 – printing in standard format
dAtE 1 – printing in increased format

- confirm choice by key **PRINT**

11. COOPERATION WITH PRINTER OR COMPUTER

Every pressing of key **<PRINT>** makes sending signal of current state of display with measure units to computer or sprinter. Scale has factory settled speed of transmission 4800 bit/s. If external mechanism (printer, computer) need to have settled different speed of transmission change factory setting about speed in menu (parameter **bod**)

11.1. Schedules of connecting conductors



11.2. Printing data with date and time

Every printout of weighing can be printed with date and time of measurement. It's possible if scale is connected to printer CITIZEN CPR02

After connecting scale and printer sett value of parameter parameter **DATE** as:

DATE 1

(see Setting date as additional parameter for printout)

11.3. Cooperation with statistic printer

After connecting scale to statistic printer statistic of measurement is possible to do. Example of printout with statistics from series of measurement:

1	9:02:15	+	7.0016	g	
2	9:02:39	+	5.0152	g	
3	9:02:58	+	12.0171	g	
4	9:03:15	+	9.9937	g	
5	9:03:34	+	12.0169	g	
6	9:03:48	+	22.0111	g	
Data 13.09.2001 Godz. 9:04					
n	6				batch quantity
sum x	68.0556	g			summary of mass of samples
$\bar{x}$	11.34260	g			average value
s	5.92328	g			standard deviation
srel	52.22	%			factor of variancy
min	5.0152	g			min value
max	22.0111	g			max value
R	16.9959	g			difference max – min

11.4. Format of sending data

Result of weighing can be sent from balance to external device after pressing the PRINT button on the balance or after sending order from the computer. Presented formats are conformable to settled parameter Pd_d = 1 (printout without last digit) for balances.

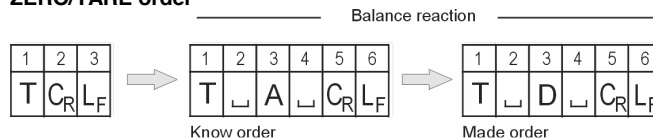
11.4.1. Format of sent data after pressing the PRINT button

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
+	□	□	□	□	0	.	0	0	0	□	□	g	□	C _R	L _F

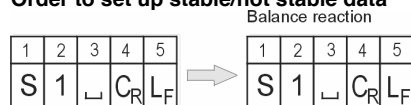
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
+	□	□	□	2	0	.	0	1	1	□	□	g	□	C _R	L _F

11.4.2. Format of sent data for orders generated from the computer

ZERO/TARE order



Order to set up stable/not stable data



Give stable result of weighing

1	2	3
S	C _R	L _F

1	2	3	4	5	6
S	□	A	□	C _R	L _F

Balance reaction: know order

Reaction of the balance for 0.0000 state

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
S	□	□	□	+	□	□	□	□	0	.	0	0	0	□	□	g	□	C _R	L _F

Reaction of the balance for 45.288g state

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
S	□	□	□	+	□	□	□	4	5	.	2	8	8	□	□	g	□	C _R	L _F

Give any result of weighing

1	2	3	4
S	I	C _R	L _F

Reaction of the balance for 0.0000 state

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
S	I				+					0	.	0	0	0			g		C _R	L _F

Reaction of the balance for 45.288g state

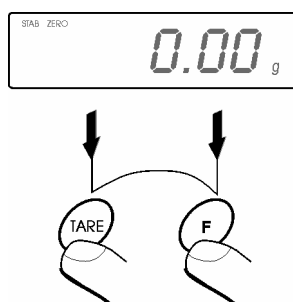
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
S	I	□	□	□	+	□	□	□	4	5	.	2	8	8	□	□	g	□	C _R	L _F

12. REPORTS FROM SCALE

Scales with internal calibration can control parameters remembered in memory very fastly. Their function can be increased. Their service functions can be done easily.

12.1. Current control of calibration fault

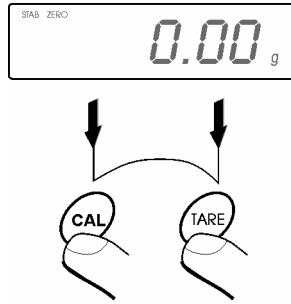
Described function is usefull if during long measurement user wants to be sure that results don't have bigger errors than terror shown on display.



When scale is in autozero zone (ZERO) press keys **TARE** and **F** at the same time. Balance starts autotest for control. Display shows calibration mass. Put the load on the pan. At the moments, scale show compares result of weighing with declared value of calibration mass. Difference between these two sizes is shown on digital display. Press **TARE** – return to weighing

12.2. Report from calibration of scale

- Connect printer with real time clock to scale (**CITIZEN CPR02**)
- Press keys **TARE** and **CAL** at the same time



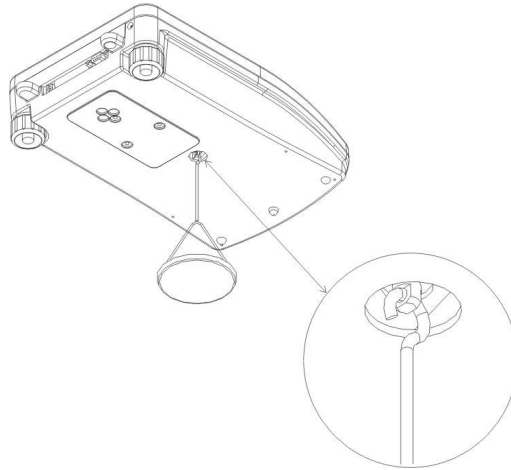
- Procedure of the reports
 - Balance starts autotest for reports.
 - Display shows calibration mass
 - Put the load on the pan.
 - Balance is in auto adjusting mode
 - When adjusting is finished, remove load from the pan
 - Display show communicate: report
 - At the moment display show calibration mass
 - Put the load on the pan.
 - Report of the calibration is printing

13. WEIGHING LOADS UNDER SCALE

In standard analytical scales can weigh load on suspension.

To use this function:

- Remove plastic plug in basic of scale
- There is suspension in the basic of scale. It's installed for good.
- Install hook to hang load (hook isn't standard equipment for scale), weigh load on hook.



Attention:

- Suspension cannot be turned around, move or manipulate. Mechanism of scale can be damaged this way.
- Mass all additional elements as scale, string should be settled to zero by pressing key **TARE**.

14. LIST OF ORDERS COMPUTER - SCALE

Function Format	TARA – equivalent for key TARE T CR LF (tare scale)
Function Format	PRINT (equivalent for key PRINT) S I CR LF (sending stage of display)
Function Format	CONSTANCE WORK - equivalent for key cont 1 C 1 CR LF (start constance transmission)
Function Format	MANUAL WORK - equivalent for order cont 0 C 0 CR LF (To change work mode on manual printout)
Function Format	STABLE DATA –equivalent for order STAB 0 S 0 CR LF (setting data to printout as stable)
Function Format	NOT STABLE DATA - equivalent for order STAB1 S 1 CR LF (setting data to printout as stable and not stable)

Attention!

*Sending order which is not in list or with error with end CR LF to scale makes return sending order in format **E S CR LF**. Spaces given in formats should be omitted. They are for better legible.*

15. ORDERS ON DIGITAL DISPLAY

Err- 5	- signalling error of temperature converter, to start scale once again turn on and off power supply
FuLL – 1	- overcrossed range of converter A/D
FuLL- 2	- overcrossed range of weighing
nuLL	- too small load of scale (np. lack of scale)
tESt	- autotest of scale is done (after turn power on)
CAL	- calibration is done
STAB	- definition parameter of stability for settling data
DATE	- printing data with date and time
CONT	- constant transmission
AUTO	- turn on/off autozero
- Co -	- choose kind of work (checking thickness of solids)
- Li -	- choose kind of work (checking thickness of liquids)
tE_L 00	- order to write temperature (during checking thickness)
H2O	- distilled water (thickness of solids)
C2H5OH	- alcohol - spirit (thickness of solids) Spirit 100% +/- 0.1% in temp. 20°C
AnoThEr	- another liquid with known thickness (thickness of solids)
VOLUME	- order to write in value of capacity of plunger (checking thickness of liquids)
LoAD A	- order to put sample on upper scale (checking thickness)
LoAD L	- order to put sample on down scale (checking thickness)
Err-3	- too much difference between start mass and settled factory mass and real start mass of scale – there is possibility to appear bigger errors
CAL Err	- error in calibration (calibrate scale once again)
bod	- function of setting speed of transmission
AC_t	- automatic calibration of scale
AuE	- average result
FIL	- digital filters
St_uni	- default unit of weighing

16. TECHNICAL PARAMETERS

Type	CY 110	CY 220	CY 360	CY 510	CY 720
Max. capacity	110g	220g	360g	510g	720g
Min. capacity	20mg				40mg
Readability	1mg				2mg
Tare range	-110g	-220g	-360g	-510g	-720
Operat. Temp	+ 15°C do +35°C				
Power	230V 50Hz AC / 10,5 V AC				
Pan size	128 x 128mm				

Type	CG 1202	CG 2202	CG 3102	CG 4102
Max. capacity	1200g	2200g	3100g	4100g
Min. capacity	500mg			
Readability	10mg			
Tare range	-1200g	-2200g	-3100g	-4100g
Operat. temp	+ 15°C do +35°C			
Power	230V 50Hz AC / 10,5 V AC			
Pan size	165 x 165mm			

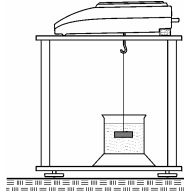
17. ADDITIONAL EQUIPMENT

17.1. Vibration damping table



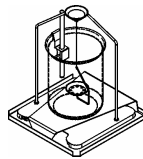
Thanks to this stable base all vibrations are eliminated. Inside of table marble plate is installed which makes foundation for balance.

17.2. Rack for weighing load under balance



It is used when weighing under balance is necessary. It is useful for magnetic load or when thickness of products is defined. Racks are used also during tests for absorptiveness of materials f.e.g. absorptiveness of foamed polystyrene. Structure of rack is made of steel. Rack is 330mm high.

17.3. Set for defining thickness of solids and liquids



It's appropriate for weighing with precision 1mg. It enables to define thickness solids and liquids. This procedure is full automatically user only puts samples on scales.

17.4. Additional display



Characterization: length of conductor between additional display and balance- 1,5m, plastic casing, possibility of bending the display

17.5. Computer softwares

- POMIARWIN – gathering data from any balance
- WEIGHTRACK – enables to introduce result of weighing to Excel.

17.6. Printers

- CITIZEN CPR02

