XK3101E Weighing Indicator

User Manual

April, 2010 Edition

- Read the manual carefully before use.
- Please take care of this manual for future reference.

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1 General Description

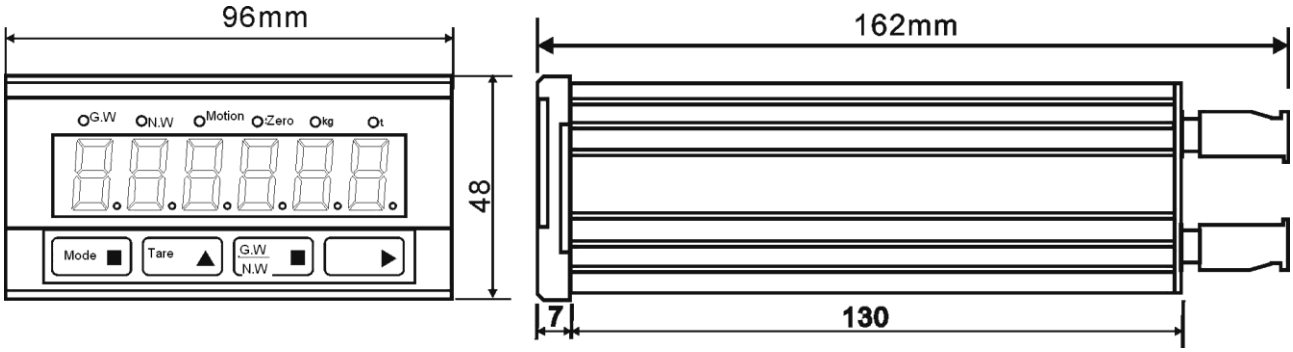
1.1 BRIEF INTRODUCTION

XK3101E is a multi-purpose weighing control indicator which can be applied in platform scales and vessel scales in general industrial and commercial fields.

1.2 MAIN CHARACTERISTICS

1、Used for strain gage load cell;
2、4 modes for testing peak value;
3、6 bits of LED digital tube display, word height: 14.5mm;
4、Display of gross weight and net weight;
5、Scale division options: 1, 2, 5, 10, 20 or 50;
6、3 scaling position options;
7、Automatic ZERO tracing;
8、Light-touch keystoke to deduct tare weight;
9、Δ-Σ mode A/D converter, resolution 24 bits;
10、Sampling rate: 200 times per second;
11、Self-test and configuration function when power-on;
12、Available setup interface for software of upper monitor function and calibration;
13、On-off switch for setup outside input as protection parameter and calibration;
14、High-low limit output interface(4 optocoupler output, Pressurization: 80VDC, 300mA);
Maximum comparison circle: 200 times per second;
15、Electric current loop interface for big screen display;
16、Analog output adjustment button(when analog output panel equipped);
Setup of analog output updating rate, maximum 200 times per second;
17、Interface panel options: RS232 / RS485 output interface;
4-20mA or 0-10V analog output panel;

1.3 OUTSIDE VIEWS OF THE DISPLAY



Control cabinet pore size：minimum 46×93mm;

2、TECHNICAL SPECIFICATION

2.1 GENERAL SPECIFICATION

1、Power supply: 110V AV, 220V±10%、50/60Hz（specified before leaving factory）
2、Consumed power: below 6 watt
3、Working temperature: from -5℃ to 50℃
4、Humidity: 85% relative humidity (no condensated water)
5、Weight: around 0.45kg

2.2 DIGITAL SECTIONS

1、Number display: 6 bits LED digital tube

2、Word height: 14.5mm

3、Indicator light: Gross Weight, Net Weight, ZERO, Weight alteration and Weight unit (KG or Ton)

4、Overload display: display “O.L”

5、Scale division display: 1, 2, 5, 10, 20, or 50;

6、Scaling position: 3 options;

2.3 ANALOG SECTIONS

1、Suitable transducer type: all strain gage load cell;

2、Load cell input voltage: 10V±5% DV，maximum 150 mA;

3、Scale division: 1.5μV/e;

4、ZERO voltage range: ±15mV;

5、Sampling ratio: 200 times per second;

2.4 RS232/RS485 SERIAL COMMUNICATION OUTPUT INTERFACE (OPTIONAL)

1、Communication panel: EIA-RS232/RS485 Serial communication output(optional)

2、Character format: 7 bits data;

1bit even parity check（EVEV）

1stop bit;

Verification code standard: ASCⅡ;

Baud rate options: 2400, 4800, 9600, 19200;

3 Communication protocol: continuous mode / command mod;

2.5 HIGH-LOW LIMIT (FIXED VALUE) OUTPUT INTERFACE

1、Output: 4;

2、Maximum capacity: 80V, 300mA DV;

2.6 ANALOG OUTPUT INTERFACE (OPTIONAL)

1、Analog output mode: 0～10V/4～20mA

2、Loading capacity: loading resistance no lower than 10KΩ when voltage output;

Loading resistance no higher than 500Ω when electric current output;

3、Output voltage when open circuit: no higher than 15V；

4、Analog precision: 0.1%FS;

2.7 INPUT INTERFACE (BUILT-IN)

1、Input control: IN1, IN2, IN3;

2、Input mode: passive switch;

3、Input contact time: 30ms (millisecond);

3、 OPERATION

3.1 GENERAL INSTRUCTION

Don’t install the indicator under exposure to sunlight;

Avoid temperature sharp rise or down, avoid libration and drench;

Earthing indicator through power supply wire, ensure goods contact.

DON’T connect the indicator earth wire with any other device earth wire;

Analog output and input signal is sensitive to electric noise; Don’t enlace the signal wire and alternating current wire together (keep it away from alternating current power).

When fluctuation of local alternating current power supply is above ±10%, make sure to use manostat (voltage regulator) to stabilize the power supply.

3.2 POWER ON SELF TEST INFOMATION

1 Model display: 3101E

2 Edition display: XUA.B. (A.B: edition number; X: when external input setup is under allowable condition, for example, “F16=0” displays “1”, “F17=0” displays “2”, “F18=0” displays “4”, all is set as 0, it is 4+2+1=7；)

3 All lights on display twice;

4 When serial communication interface available, it will displays baud rate (such as 9600) first, then displays communication mode(RS232 or RS485), and finally displays indicator address (such as Add 02).

5 When analog interface available, it displays analog mode (0~10 or 4~20).

6 Displays “------”.

7 Displays current weight.

3.3 CONNECTION FO LOAD CELL AND DISPLAY

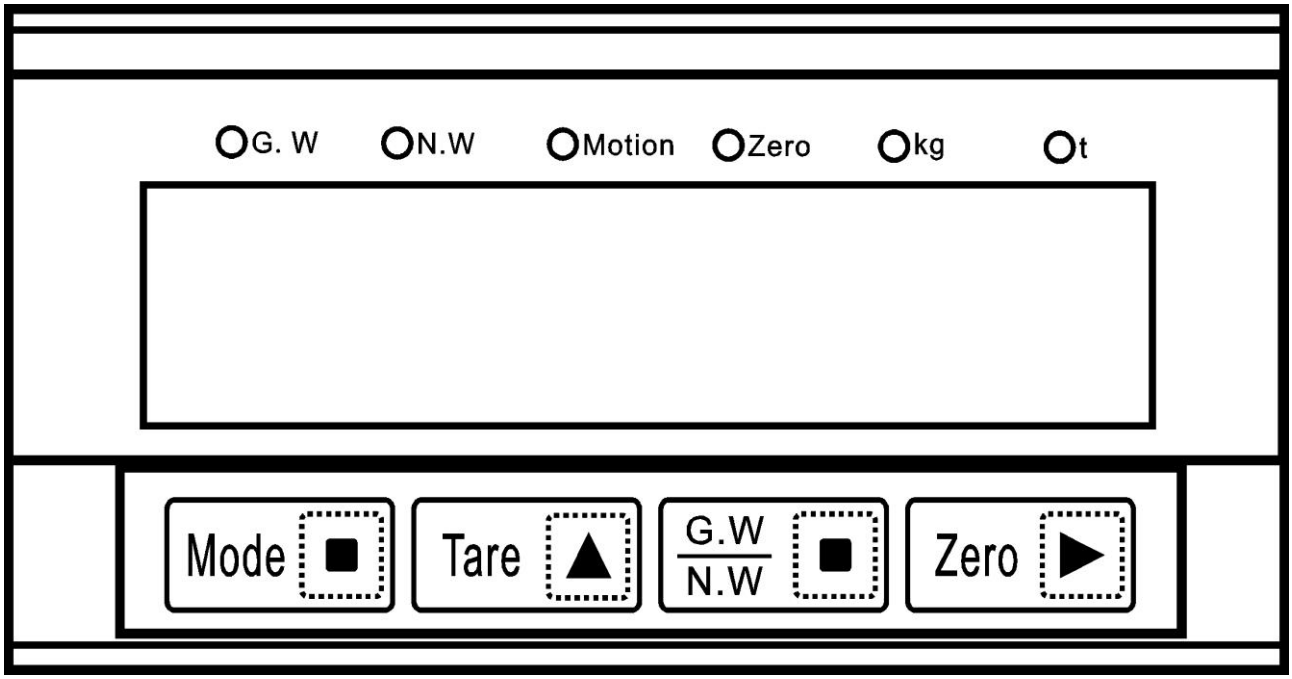
Output display of load cell is sensitive to electric noise. Don’t enlace the signal wire and alternating current wire together (keep it away from alternating current power).

Load cell Wiring	
Indicator PIN identifier	Message
+EXC	Excitation voltage output +
-EXC	Excitation voltage output -
+SIG	Signal input +
-SIG	Signal input -
SHIELD	Shield

When six-conductor shielded cable is used, please short circuit the load cell +EXC with +FEEDBACK wire, -EXC with –FEEDBACK!

4、INSTRUCTION OF DISPLAY AND KEYSTOKE

4.1 DISPLAY



Enter into function parameter setup condition: Press Mode and GW/NW simultaneously; 2 seconds layer, it displays “FUNC”.

Enter into calibrating condition: press Mode and TARE simultaneously; 2 seconds later, it displays “CAL”.

Enter into High-Low limit setup condition: Press Mode and ZERO simultaneously; 2 seconds later, it

displays “SET”;

ON-OFF of the display: Press Mode for 3 seconds;

4.2 FRONT PANELINSTRUCTION

【GW/NW】Keystoke: GW/NW display switch.

【TARE】Keystoke: the data add 1 when input data; press it to deduct tare weight when displays GW; press it to eliminate the Tare weight.

【ZERO】Keystoke: choose high-low limit input data; press it to reset to zero when zero drift no more than1%~20% FS.

GW indicator light: displays GW when light on.

GW indicator light: displays NW when light on.

Dynamic indicator light: the being weighed is under unstable condition when light on.

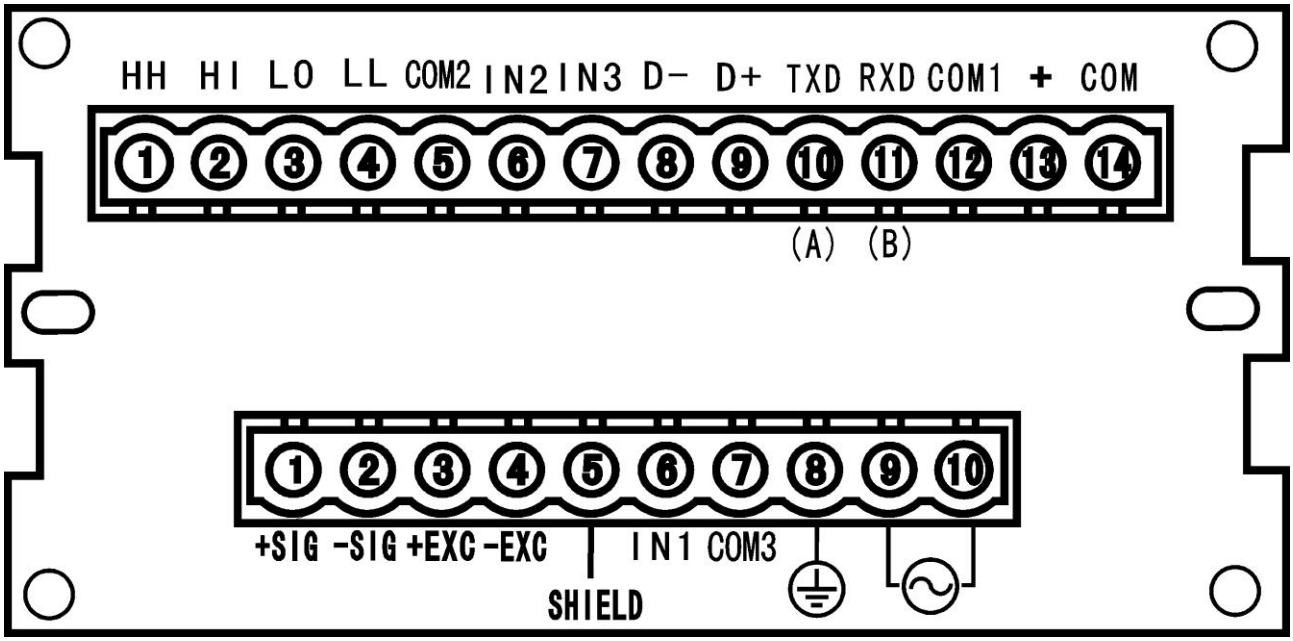
ZERO indicator light: displays GW=Zero when light on.

kg indicator light: displays unit: kilogram when light on.

t indicator light: displays unit: tonne when light on.

Remarks: negative value cannot setup but can display under data setup condition.

4.3 BACK PANEL INSTRUCTION



1. Power supply input end: ⏦ 220V AV / 110V AV，⏚ earthing end.
2. Input end of load cell: SIG+，SIG-，EXC+，EXC-，SHIELD
3. Input end: IN1, IN2, IN3, Input common port.
4. High-low limit output end: HH, HI, LO, LL Output end.
5. Serial communication end: TXD（A）, RXD（B）, COM.
6. Analog signal output end: +, COM.
7. Large screen display interface: D+，D-.

5、FUNCTION SETUP (PARAMETER F1~F23)

*Remarks: short circuit the output end and input end when external input was set into calibration protection condition; To enter into function setup condition it is necessary to short circuit IN1 and input common port, since the factory default 1 is the parameter setup protection switch.

Enter into function setup: press MODE and GW/NW simultaneously, 2 seconds later, it displays “FUNC” and Enters into function setup condition (can set parameter from “F0 0” to “F23 XX”).

Keystoke instruction:

【ZERO】keystoke: choose the needed function number (from F0→F23→F0 circularly）.

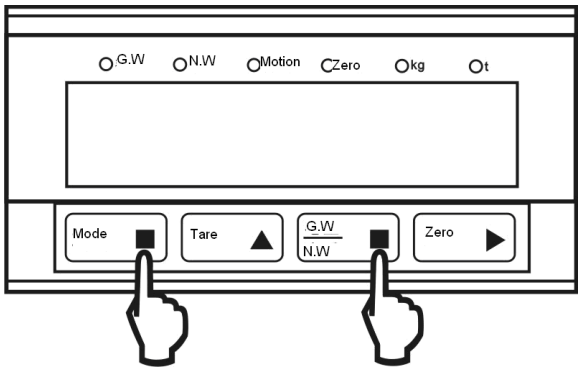
【TARE】keystoke: choose the needed data (FX from 0 to 1, 2, …etc.).

Remarks: set the parameters through RS232/RS485 under weighing condition.

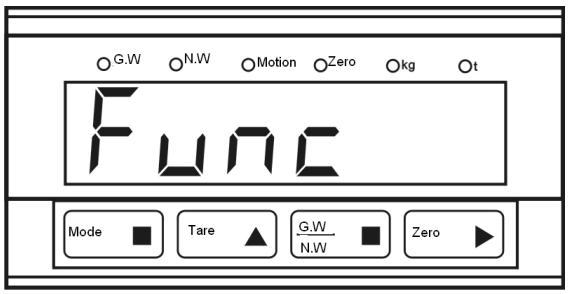
5.1 PARAMETER SETUP

Enter into parameter setup condition:

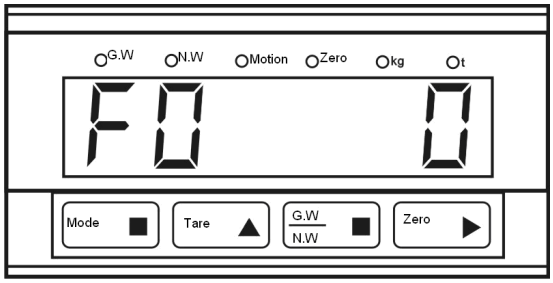
Press 【MODE】and【GW/NW】simultaneously, 2 seconds layer, it displays “FUNC”.



2 seconds later



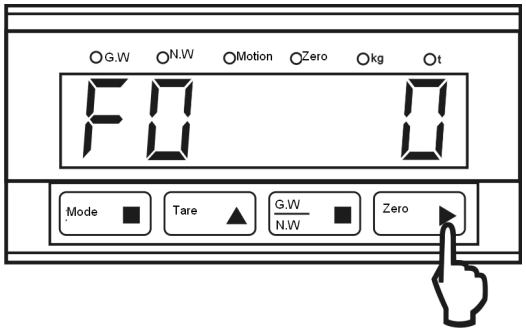
2 seconds later



5-1-1“F0 0” EXIT setup

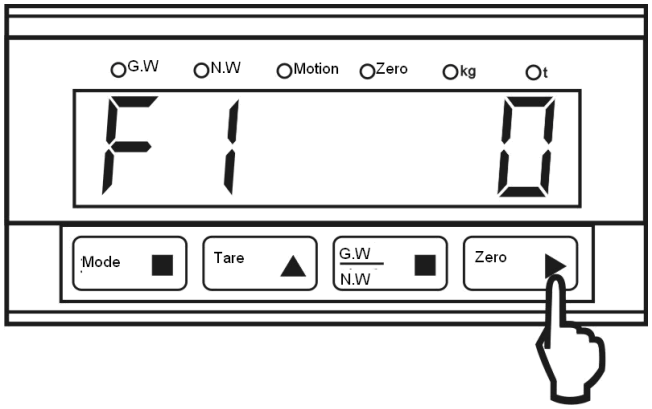
Press【MODE】 keystoke, effective input, enter into weighing condition,

Press【ZERO】 keystoke to enter into next parameter setup



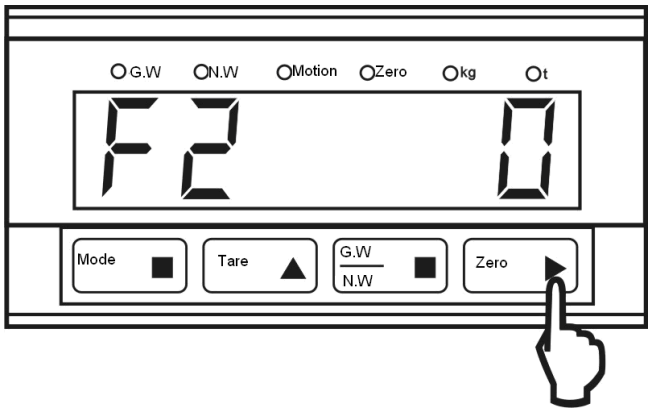
5.1.2“F1 0” ZERO follow time

Press 【ZERO】 keystoke and choose 0= no follow
1=1 second
Press【ZERO】 keystoke to enter into next parameter setup



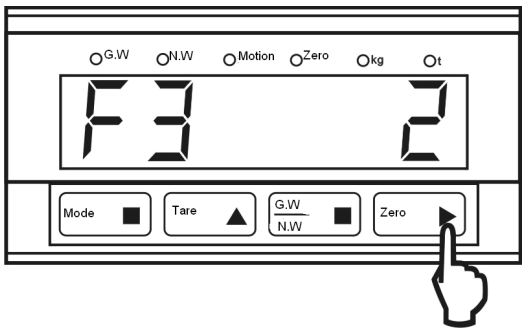
5.1.3“F2 0” ZERO follow range

Press【TARE】 keystoke to choose 0=0.5d/second
1=1d/second
2=3d/second
3=5d/second
Press【ZERO】 keystoke to enter into next parameter setup



5.1.4“F3 2” dynamic inspection

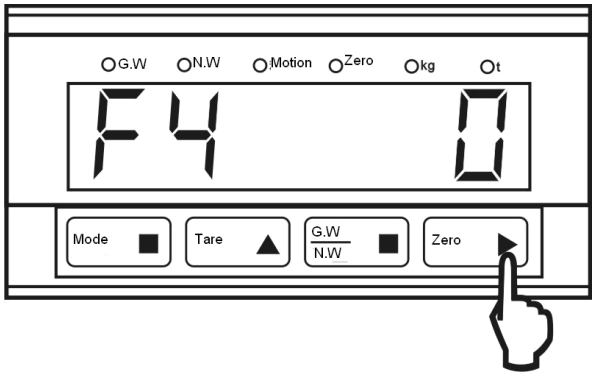
Press【TARE】 keystoke to choose 0=stable judgement forbidden
1=1d
2=3d
3=5d
Press【ZERO】 keystoke to enter into next parameter setup



5.1.5“F4 0” power on self zero clearing range

Press【TARE】 keystoke to choose 0=Power on zero clearing forbidden
1=±4%FS
2=±10%FS
3=±20%FS

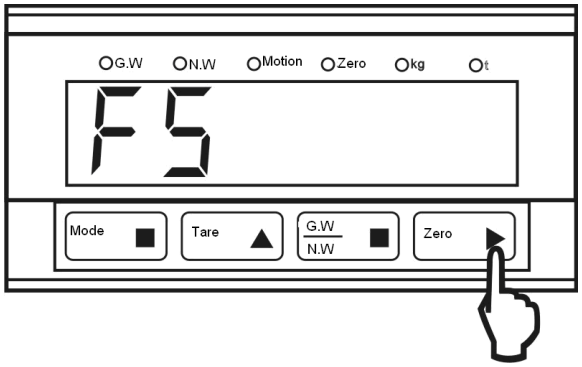
Press【ZERO】 keystoke to enter into next parameter setup



5.1.6“F5 ”

Retention parameter, setup needless;

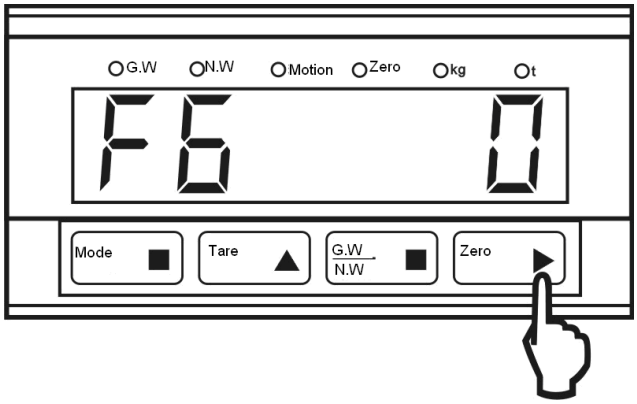
Press 【ZERO】 keystoke to enter into next parameter setup



5.1.7“F6 ”switching value output mode

Press【TARE】 keystoke to choose 0=U-D mode
1= value fixed mode

Press 【ZERO】 keystoke to enter into next parameter setup

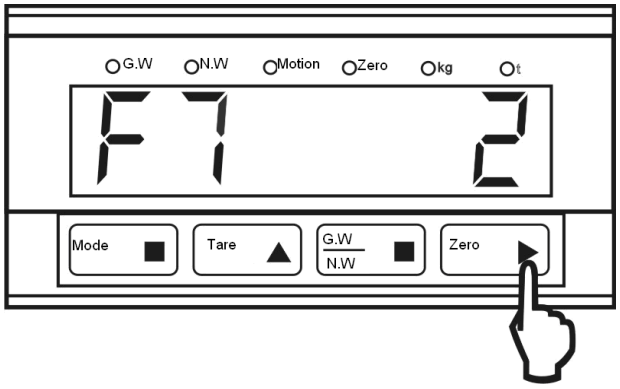


5.1.8“F7 0” baud rate

Press 【TARE】 keystoke to choose 0=2400

1=4800
2=9600
3=19200

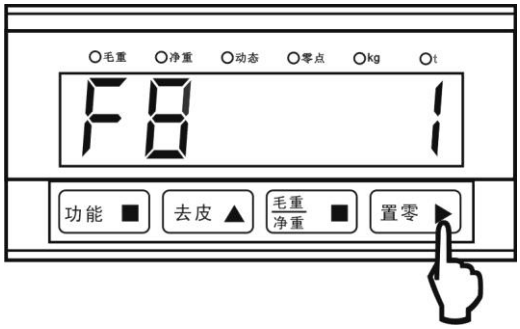
Press 【ZERO】 keystoke to enter into next parameter setup



5.1.9“F8 0”RS232/RS485 output mode

Press 【TARE】keystoke to choose 0= continuous mode
1=command mode

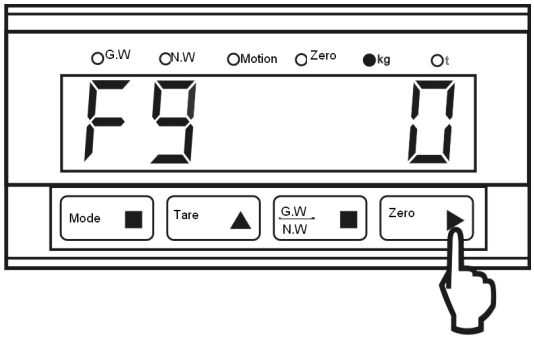
Press 【ZERO】 keystoke to enter into next parameter setup.



5.1.10“F9 0” Unit

Press 【TARE】 keystoke to choose 0=kg
1=t

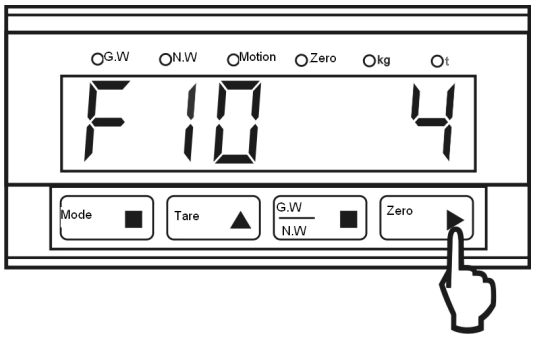
Press 【ZERO】 keystoke to enter into next parameter setup



5.1.11“F10 0” ZERO setting range

Press【TARE】 keystoke to choose “0—20”, number stands for percent of manual zero setting range, 0 stands for manual zero setting forbidden.

Press 【ZERO】 keystoke to enter into next parameter setup

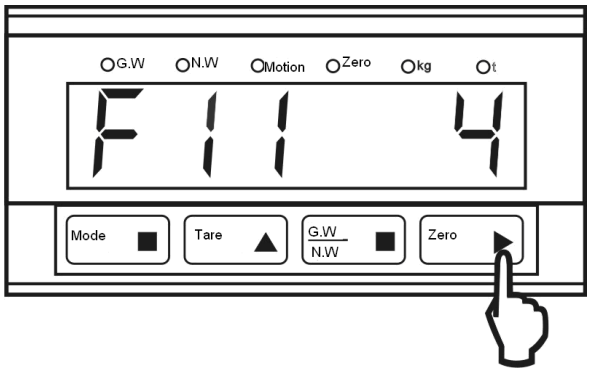


Remarks: the biggest ZERO return range is 1%~20% FS in weighing condition.

5.1.12“F11 0” digital filtering;

Press【TARE】 keystoke to choose “0~9”, each number stands for different filtering intensity, the bigger the number is, the stronger filtering and longer stabilization is.

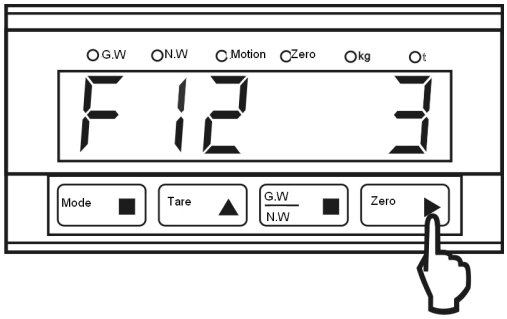
Press【ZERO】 keystoke to enter into next parameter setup.



5.1.13“F12 0” displays updating rate

Press 【TARE】keystoke to choose 0=1timer per second
1=2 times per second
2=5 times per second
3=10 times per second
4=20 times per second

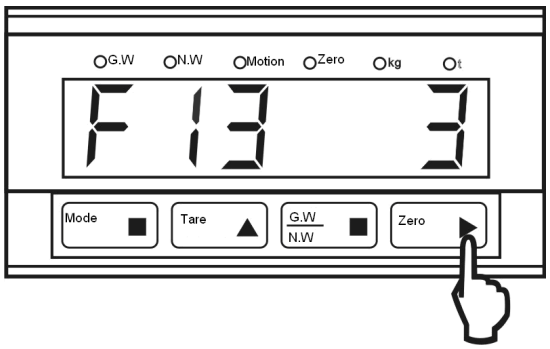
Press【ZERO】 keystoke to enter into next parameter setup.



5.1.14“F13 0” output rate of serial communication interface

Press【TARE】keystoke to choose 0=1 time per second
1=2 times per second
2=5 times per second
3=10 times per second
4=20 times per second

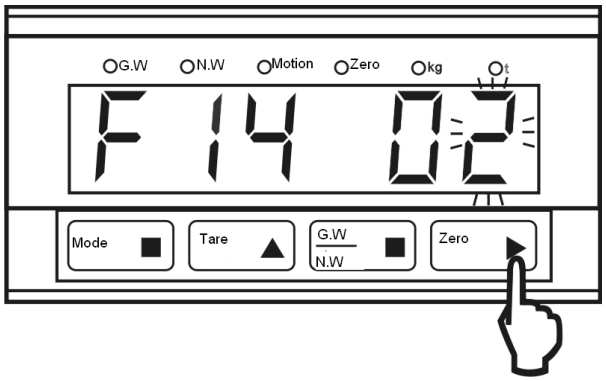
Press【ZERO】 keystoke to enter into next parameter setup.



5.1.15“F14 0” indicator address

Press【TARE】keystoke plus 1，按【GW/NW】keystoke to change the gleaming position; address range:0~99.

Press【ZERO】 keystoke to enter into next parameter setup.



5.1.16“F15 0” peak hold

Press【TARE】keystoke to choose 0= no peak hold

1= peak hold, auto-clear

2= peak hold, manual clear

3= peak hold when external input is valid, clear when invalid

4= external trigger instantaneous value capture

Detailed instruction: **F15=0**

No peak hold, default, when IN1（F16）or IN2（F17）or IN3（F18）is set as 7, lock in function will be valid for external input value.

F15=1

Peak hold, auto-clear; capture starts when it is above 100 division, auto-clear peak value when it is below 100 division.

GW light gleams and begins to capture peak value when the weight is above 100 divisions.

Press MODE to clear peak value, or, set IN1(F16) or IN2 (F17) or IN3(F18) as 5 and clear through external trigger.

F15=2

Peak hold, manual clear (press MODE), or clear through external trigger,; capture starts when it is above 100 division.

External input will clear peak value when IN1 (F16) or IN2 (F17) or IN3 (F18) is set as 5.

F15=3

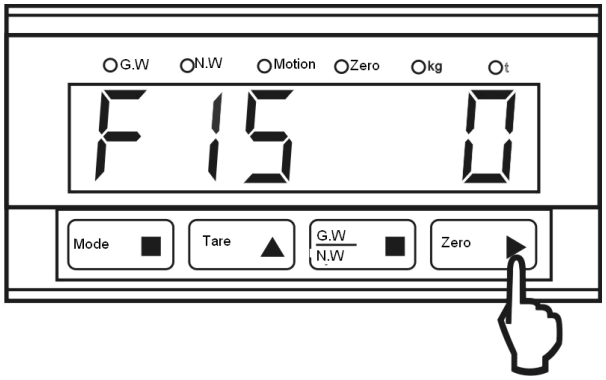
Peak hold initiates when external input is valid (or set F16 or F17 or F18 as 8, and input continuous through), clears when invalid. The GW light gleams upon valid input.

F15=4

external trigger instantaneous value capture

Instantaneous value initiates when external input is valid (or set F16 or F17 or F18 as 8, and input continuous through); the GW light gleams upon capture finished.

Press【ZERO】 keystoke to enter into next parameter setup.



5.1.17“F16 0” input 1 function

Press【TARE】keystoke to choose 0=allow to turn-on/-off the calibration or function setup

1=set ZERO

2= TARE

3=GW/NW

4=PRINT (output through serial communication interface, same format as continuous transit)

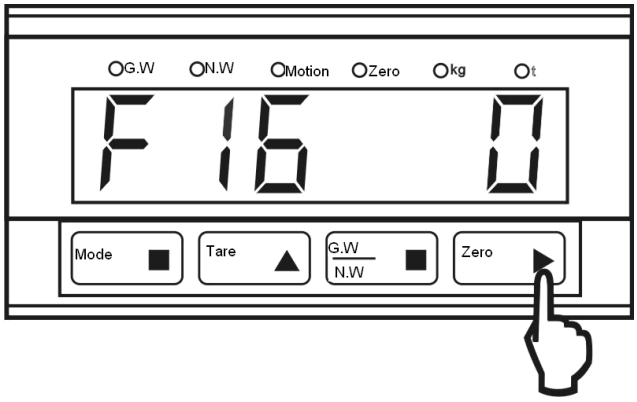
5=PEAK VALUE clear

6=ON/OFF switch of display

7=display value hold

8=peak hold

Press【ZERO】 keystoke to enter into next parameter setup.



5.1.18“F17 0” input 2 function

Press【TARE】keystoke to choose 0=allow to turn-on/-off the calibration or function setup

1=set ZERO

2= TARE

3=GW/NW

4=PRINT (output through serial communication interface, same format as continuous transit)

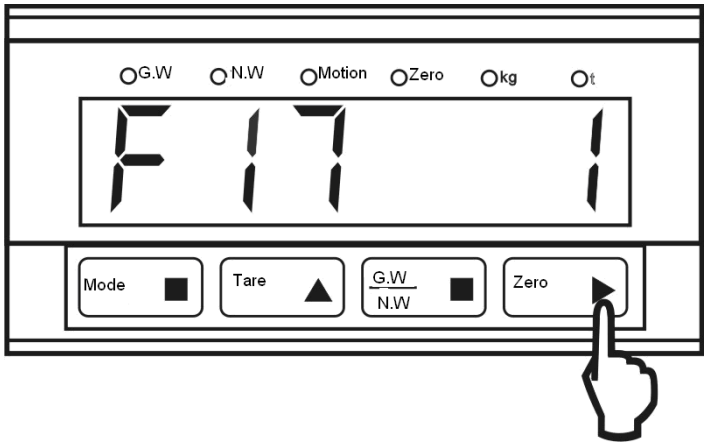
5=PEAK VALUE clear

6=ON/OFF switch of display

7=display value hold

8=peak hold

Press【ZERO】 keystoke to enter into next parameter setup.



5.1.19“F18 0” input 3 function

Press【TARE】keystoke to choose 0=allow to turn-on/-off the calibration or function setup

1=set ZERO

2= TARE

3=GW/NW

4=PRINT (output through serial communication interface, same format as continuous transit)

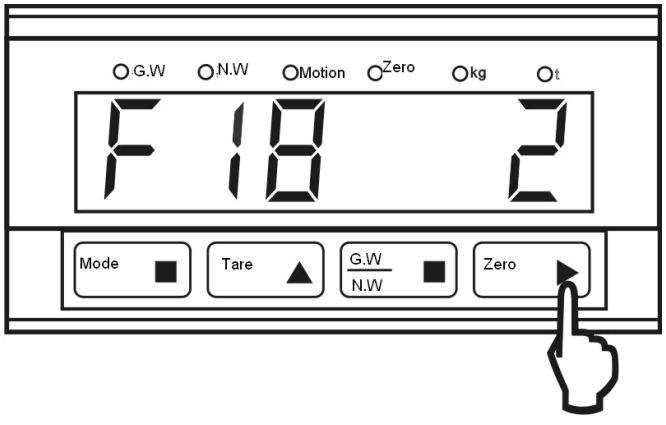
5=PEAK VALUE clear

6=ON/OFF switch of display

7=display value hold

8=peak hold

Press【ZERO】 keystoke to enter into next parameter setup.



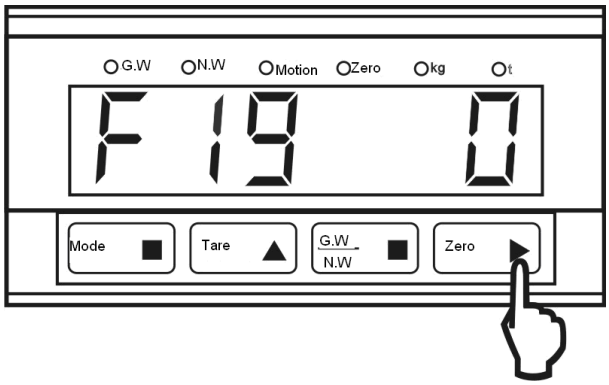
5.1.20“F19 0” high-low limit output comparison conditions

Press 【TARE】keystoke to choose 0=GW

1=NW

2=display weight

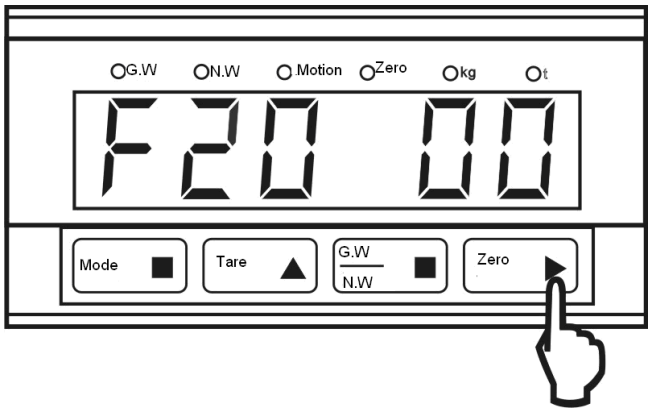
Press【ZERO】 keystoke to enter into next parameter setup.



5.1.21“F20 0” average times of high-low limit output sampling

Press【TARE】keystoke to choose “0~10”, each number stands for average times, for example, if choose 4,then it will output once of the on-off switch value after sampling 4 times average, and the actual comparison output is 50 times per second; if choose 1, then it will output once of the on-off switch value after sampling once average, and the actual comparison output is 200 times per second; if choose 0, then it displays and comparison synchronously.

Press【ZERO】 keystoke to enter into next parameter setup.



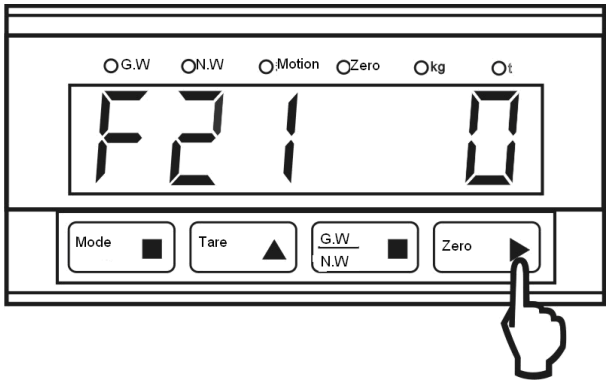
5.1.22“F21 1” analog output mode

Press【TARE】keystoke to choose 0=voltage 0~10V

1=current 4~20mA

Above parameter only valid in analog module is equipped.

Press【ZERO】 keystoke to enter into next parameter setup.



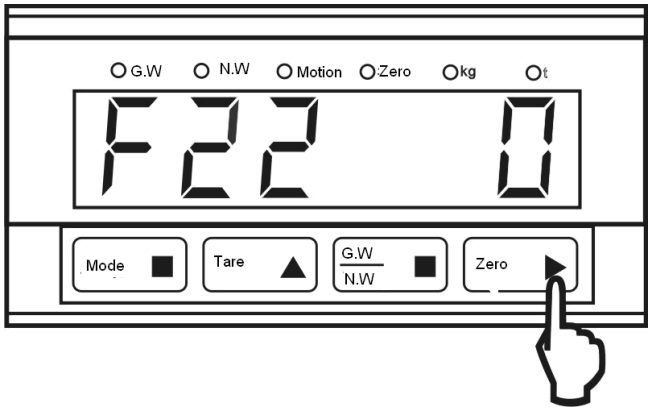
5.1.23“F22 0”analog output corresponding conditions

Press【TARE】keystoke to choose 0=corresponding Gross Weight

1=corresponding Net Weight

Above parameter only valid in analog module is equipped.

Press【ZERO】 keystoke to enter into next parameter setup.



5.1.24“F23 00” average times of analog output sampling

Press【TARE】keystoke to choose “0~10”, each number stands for average times, for example, if choose 4,then it will output once of the on-off switch value after sampling 4 times average, and the actual comparison output is 50 times per second; if choose 1, then it will output once of the on-off switch value after sampling once average, and the actual comparison output is 200 times per second; if choose 0, then it displays and comparison synchronously.

5.2 RS232 / RS485 interface setup (available in RS232 / RS485 equipped)

Function setup can be done through RS232/RS485 communication interface in normal weighing condition. If the address is 0, input “FUNC<CR><LF>”, the indicator displays “FUNC”. If the address is 0, it’s necessary to input “<ENQ>IDXX<CR><LF>” first, the indicator returns “<ACK>XX<CR><LF>”, and then input “FUNC<CR><LF>”, the indicator returns “FUNC”.

Input:

ASCII	FUNC<CR><LF>
Hexadecimal	46 55 4E 43 0D 0A

Indicator output:

ASCII	YES<CR><LF>
Hexadecimal	59 45 53 0D 0A

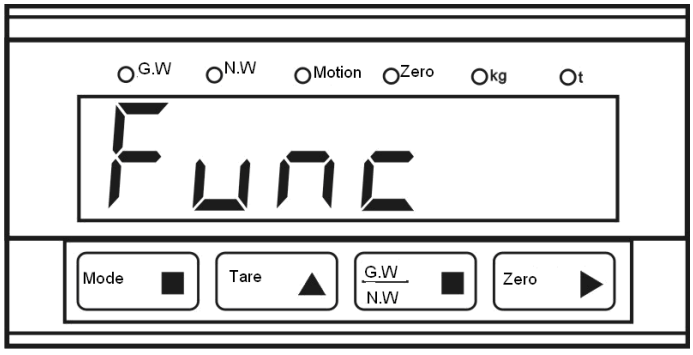
Input: 05 49 44 30 32 0d 0a

ASCII	<ENQ>ID02<CR><LF> (take address2as example)
Hexadecimal	05 49 44 30 32 0D 0A

Indicator output:

ASCII	<ACK>02<CR><LF> (take address2as example)
Hexadecimal	06 30 32 0D 0A

Indicator display:



5.2.1 Parameter setup

Input:

ASCII	SET F1=0<CR><LF> (take parameter F1=0 as example)
Hexadecimal	53H 45 54 20 46 31 3D 30 0D 0A

Indicator output:

ASCII	F1=0<CR><LF> (take parameter = 0 as example)
Hexadecimal	46 31 3D 30 0D 0A

The returned parameter accords with the input. When it is out of parameter range, the indicator will return:

ASCII	NO?<CR><LF>
Hexadecimal	4E 4F 3F 0D 0A

Other parameters can be set like above. Such as:

SET F2=0<CR><LF>;

SET F10=4<CR><LF>;

SET F23=0<CR><LF>; etc..

5.2.2 Parameter reading

Input:

ASCII	READ F1<CR><LF> (take FA as example)
Hexadecimal	52 45 41 44 20 46 31 0D 0A

Indicator output:

ASCII	F1=0<CR><LF> (take parameter = 0 as example)
Hexadecimal	46 31 3D 30 0D 0A

Other parameters can be set like above. Such as:

READ F2<CR><LF>;

READ F10<CR><LF>;

READ F22<CR><LF>; etc..

5.2.3 Quit

Input:

ASCII	R<CR><LF>
Hexadecimal	52 0D 0A

The indicator outputs “YES”, quits setup process, and displays the current weight.

6 Calibration

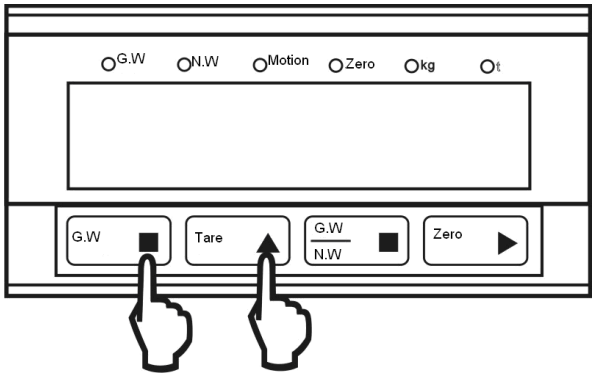
*Remarks: recommend to warm-up the indicator half an hour before use.

*Remarks: Short circuit the input port and common port when the external input is set as calibration protective switch. Input 1 is the factory fault calibration protective switch, thus it is necessary to short circuit IN1 with input common port.

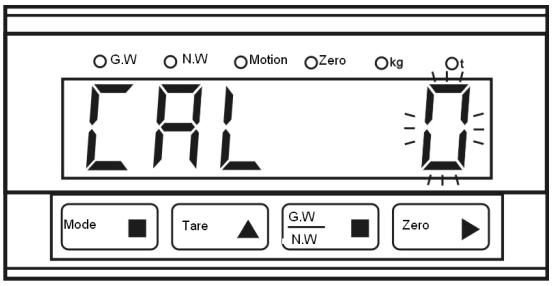
*Remarks: there are 3 calibration methods: poise calibration, modulus input, measuring instrument input method.

6.1 Poise calibration (CAL 0)

(1) Press【MODE】and【TARE】 simultaneously, 2 seconds later, the indicator displays “CAL 0”. The number could be 0, 1 or 2, which stands for the last correct calibration method.

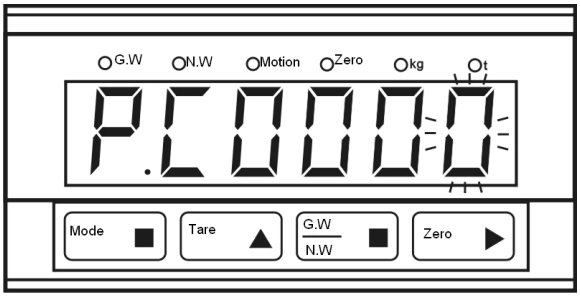


2 seconds later



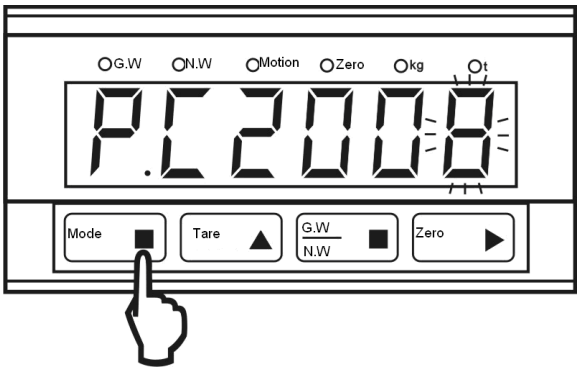
If the number is not 0, press 【TARE】to choose 0.

(2) Press 【MODE】 and the indicator displays: input calibration keyword.

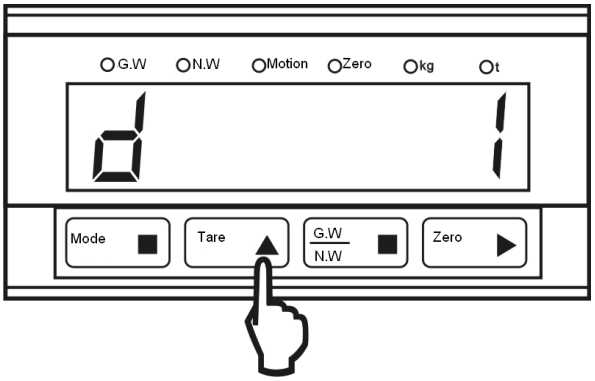


Press 【ZERO】to change the gleaming position, press 【TARE】to add 1, input “2008”.

(3) Press【MODE】.

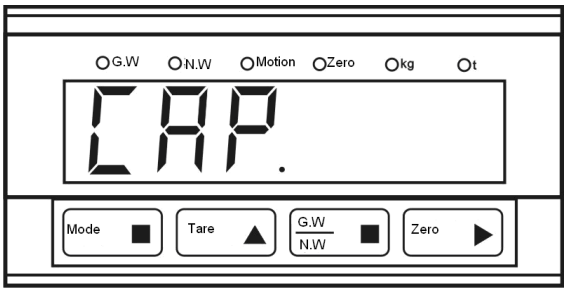


(4) The indicator displays “d 1”, then choose division value.

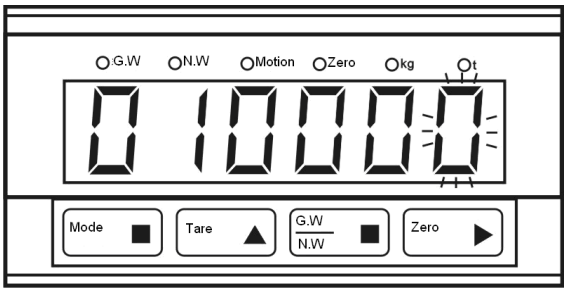


Press 【TARE】to choose division value, press【MODE】to enter into next step.

(5) The indicator displays

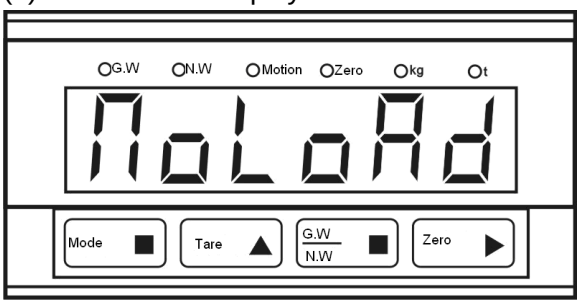


1 second later the indicator displays (take the last rated capacity 10000 as example).



Press【ZERO】to change the gleaming position, press【TARE】to add 1, input the rated capacity.

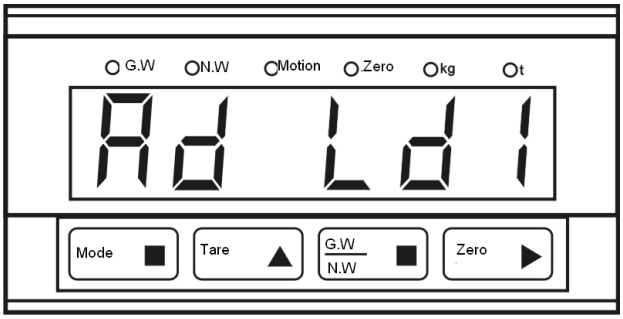
(6) The indicator displays “NoLoAd” to set zero point calibration.



Press 【MODE】to startup zero point calibration, the indicator displays 10 seconds countdown timer, and enters into next step.

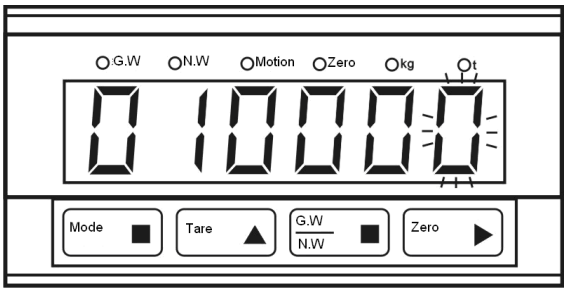
Press 【TARE】to skip zero point calibration and enter into next step.

(7) Load calibration “Ad Ld1”.



Add poise onto the measuring instrument, and the indicator displays 10 seconds countdown timer, and enters into next step.

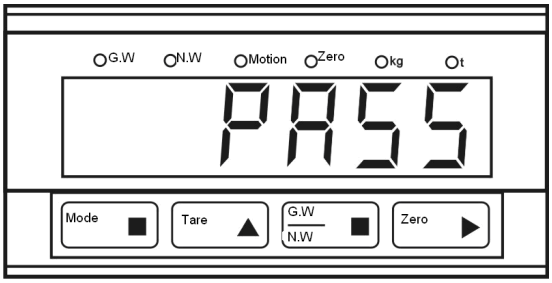
(8) Indicator displays



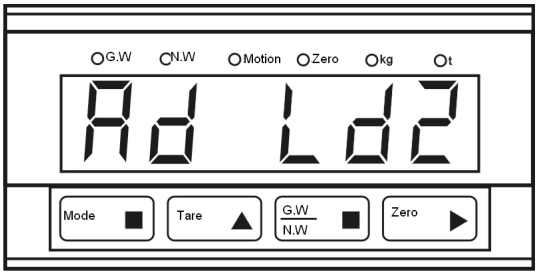
Press【ZERO】to change the gleaming position, press【TARE】to add 1, input poise weight.

Press【MODE】to enter into next step. The indicator displays “E—7” when incorrect input (=0 or above full scale). Please input the correct one.

(9) Indicator displays



Displays below 1 second later

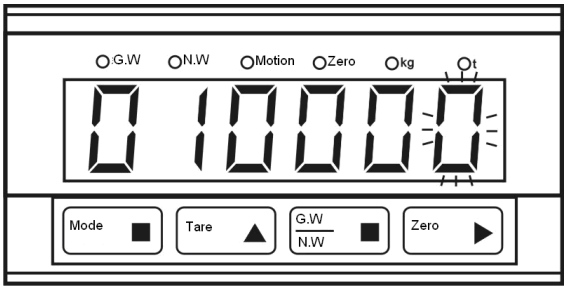


Go on adding poise onto the measuring instrument to process second phase non-linearity rectification, the indicator displays 10 seconds countdown timer, and enter into next step.

When it is unnecessary to process non-linearity rectification, press 【ZERO】to quit out and end up calibration process. The indicator displays current weight.

Remarks: most measuring instruments do not need the non-linearity rectification.

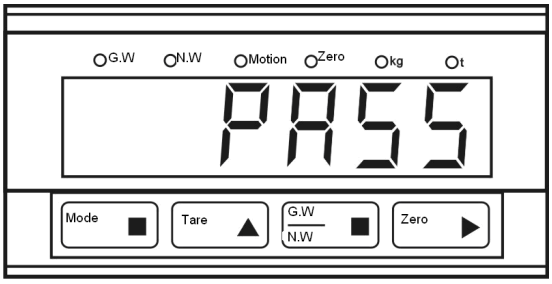
(10) Indicator displays



Press【ZERO】to change the gleaming position, press【TARE】to add 1, input twice the total poise weight.

Press 【MODE】to enter into next step. The indicator displays “E—7” when incorrect input (=0 or above full scale). Please input the correct one.

(11) Indicator displays

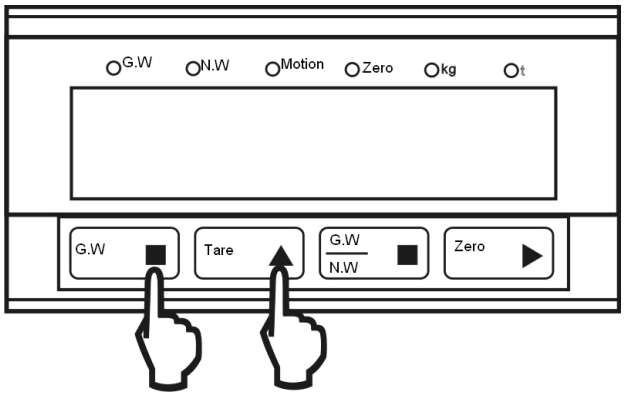


The indicator displays current weight 1 second later, and end up the calibration process.

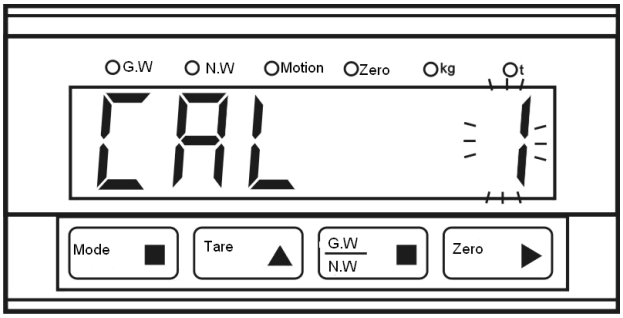
During the calibration process, if the indicator displays “E- - 5”, then the signal wires were inversely connected; if it indicates “E- - 6”, then the load cell sensitivity is insufficient.

6.2Modulus input method (CAL 1)

(1) Press 【MODE】and【TARE】 simultaneously, the indicator displays “CAL 0” 2 seconds later. The number could be 0, 1 or 2, which stands for the last correct calibration method.

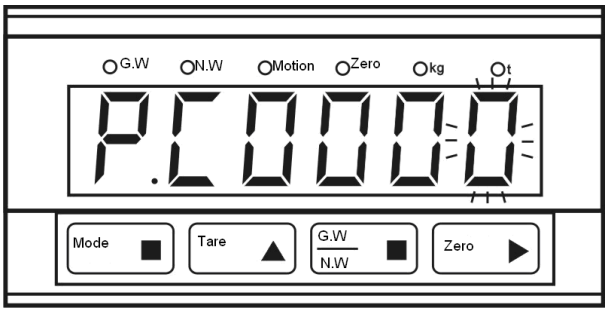


Displays below 2 seconds later



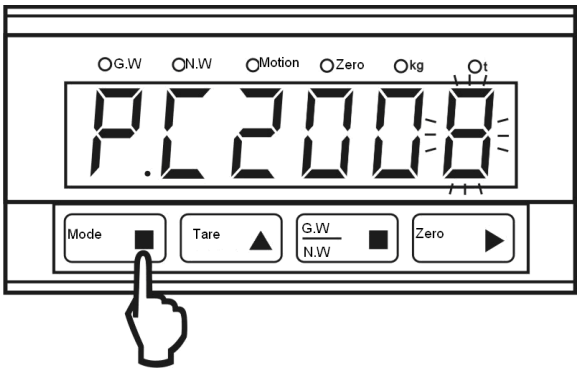
If the number is not 0, press 【TARE】to choose 1.

(2) Press 【MODE】 and the indicator displays: input the keyword.

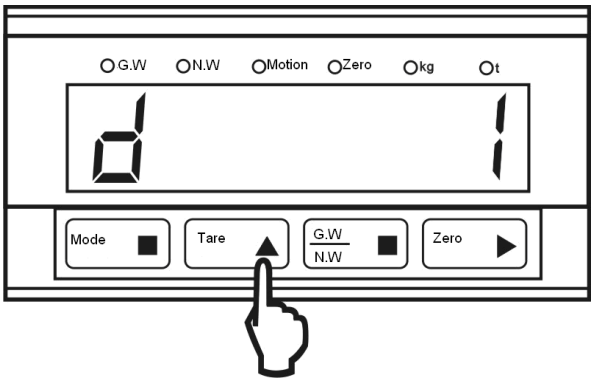


Press 【ZERO】to change gleaming position, press 【TARE】to add1, input “2008”.

(3) Press【MODE】.

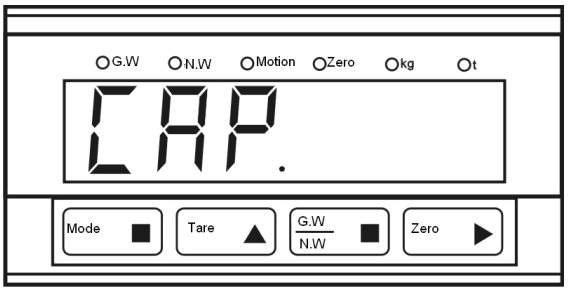


(4) The indicator displays “d 1”, then choose the division value.

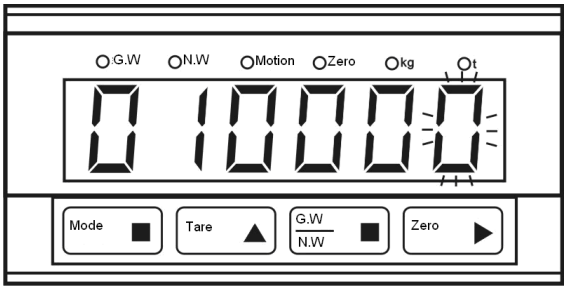


Press 【TARE】to choose proper division value, press【MODE】to enter into next step.

(5) The indicator displays



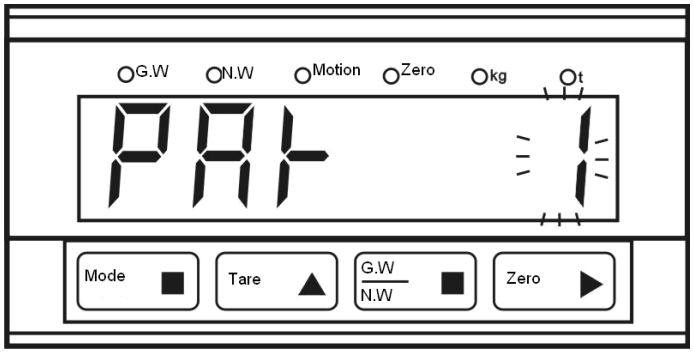
Displays below 1 second later (take the last rated capacity 10000 as example).



Press【ZERO】to change the gleaming position, press【TARE】to add 1, input the rated capacity.

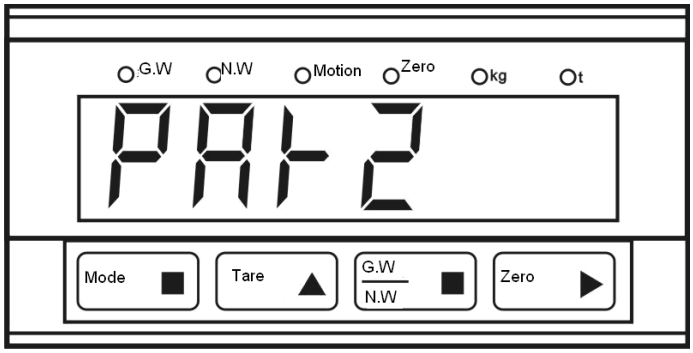
Press 【MODE】to enter into next step.

(6) The indicator displays

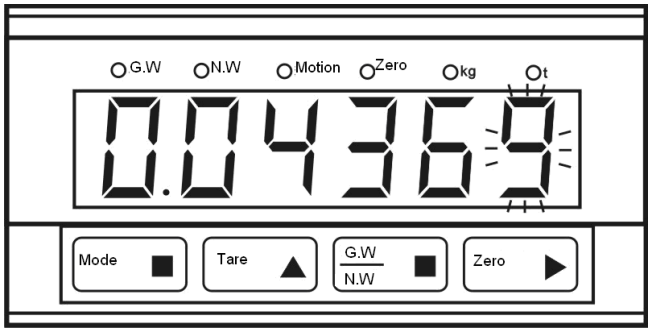


This parameter is the rectification point; 1 stands for once load calibration, 2 stands for twice load calibration, press【TARE】to enter into parameters. Press 【MODE】to enter into next step.

(7) The indicator displays the first criteria.

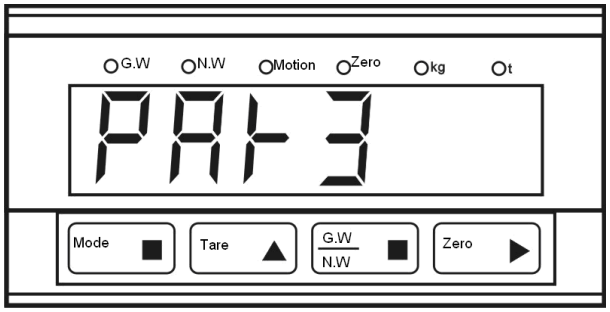


Displays below 1 second later (the number is merely as example)

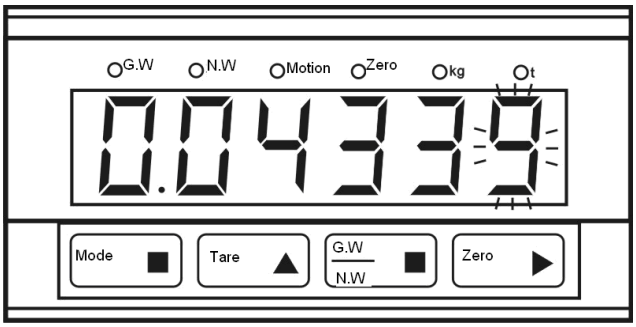


Press【ZERO】to change the gleaming position, press【TARE】to add 1, input the first criteria. Press 【MODE】to enter into next step.

(8) The indicator displays the second criteria.



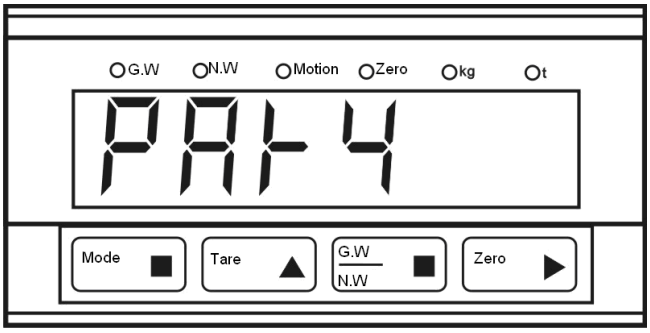
Displays below 1 second later (the number is merely as example)



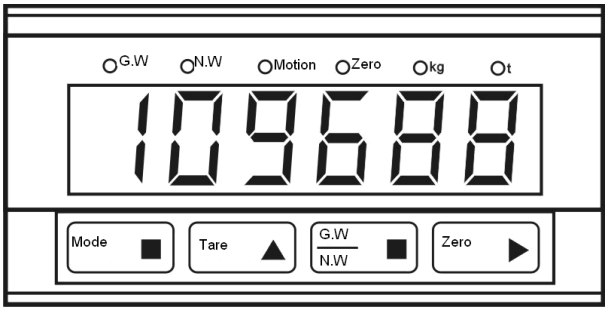
Press【ZERO】to change the gleaming position, press【TARE】to add 1, input the second criteria. Press【MODE】to enter into next step.

If PAR1=1, this parameter will not display.

(9) The indicator displays the first ISN value.



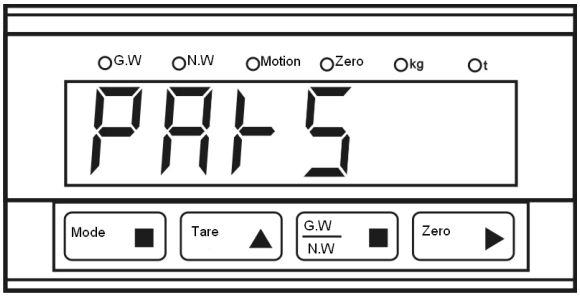
Displays below 1 second later (the number is merely as example)



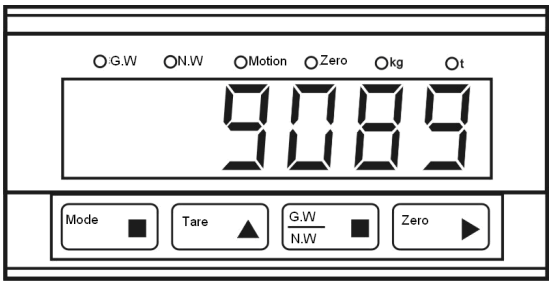
Press【ZERO】to change the gleaming position, press【TARE】to add 1, input the value. Press【MODE】to enter into next step.

If PAR1=1, this parameter will not display.

(10) Input the ZERO ISN.

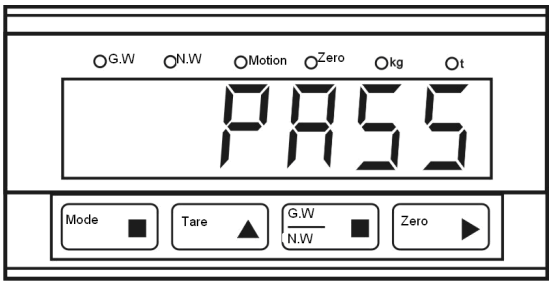


Displays below 1 second later (the number is merely as example)



Press【ZERO】to change the gleaming position, press【TARE】to add 1, input the value. Press【MODE】to enter into next step.

(11) The indicator displays “PASS”

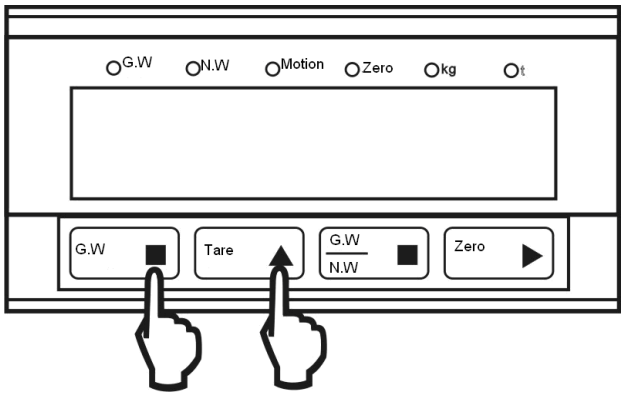


The indicator displays the current weight 1 second later, and the parameter setup process is finished.

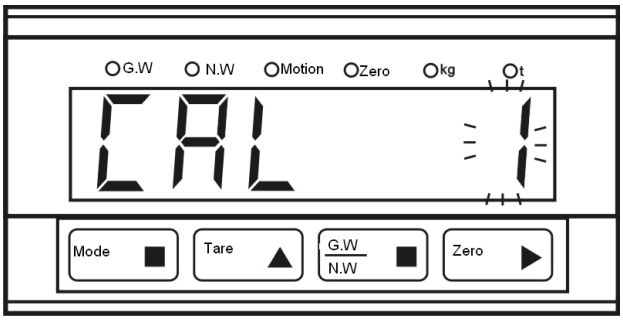
Sum-up: when PAR1=1, just input PAR2 and PARA5.

6.3 Input method of weighing apparatus parameter (CAL 2)

(1) Press 【MODE】and 【TARE】 simultaneously, the indicator displays “CAL 0” 2 seconds later, the number could be 0, 1 or 2, which stands for the last correct calibration method.

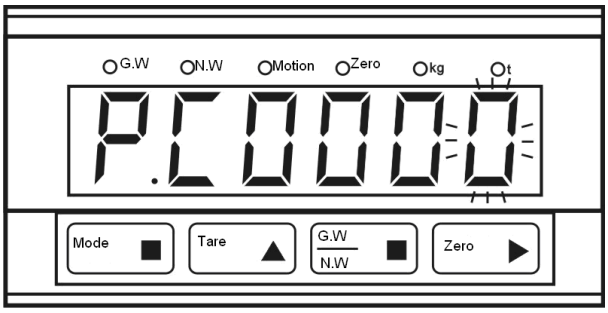


The indicator displays below 2 seconds later,



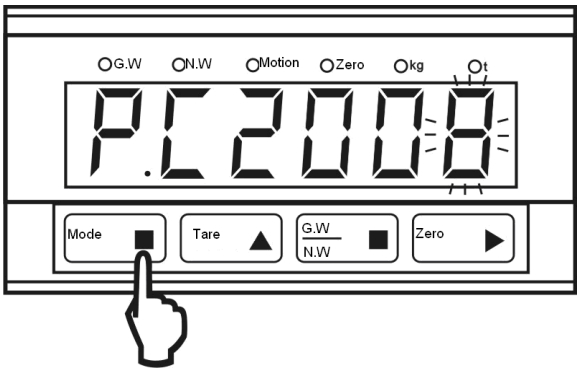
If it is not 0, press 【TARE】to choose 1.

(2) Press【MODE】, the indicator displays: input the keyword.

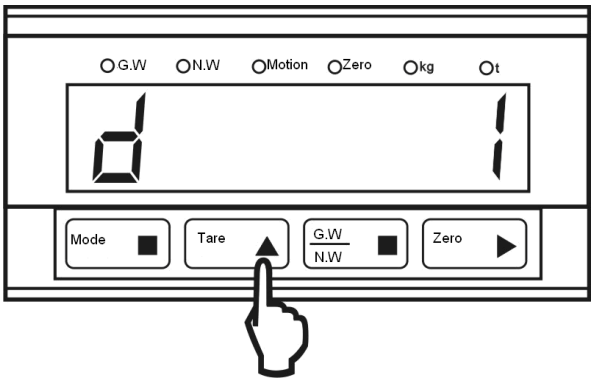


Press 【ZERO】to change the gleaming position, press【TARE】to add 1, input “2008”.

(3) Press 【MODE】.

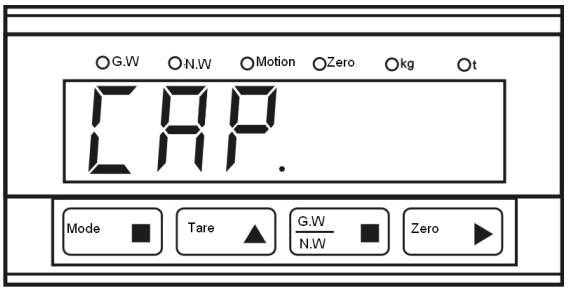


(4) The indicator displays “d 1”, choose the division value.

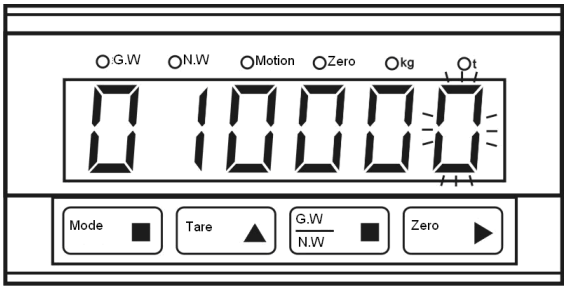


Press 【TARE】to choose the proper division value, press 【MODE】to enter into next step.

(5) The indicator displays below,



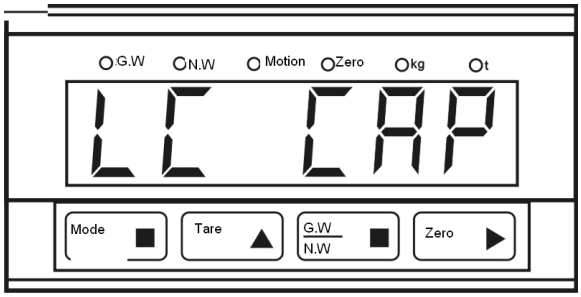
It displays below 1 second later (take the set rated capacity 10000 as example).



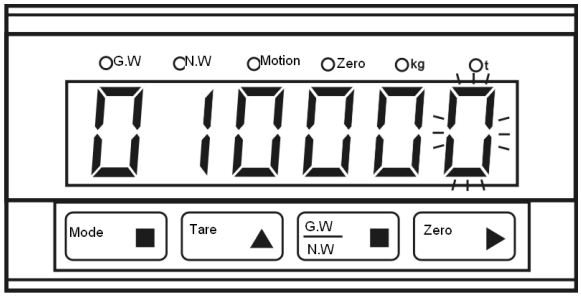
Press 【ZERO】to change the gleaming position, press【TARE】to add 1, input the rated capacity.

Press 【MODE】to enter into next step.

(6) Input the overall capacity of load cell.



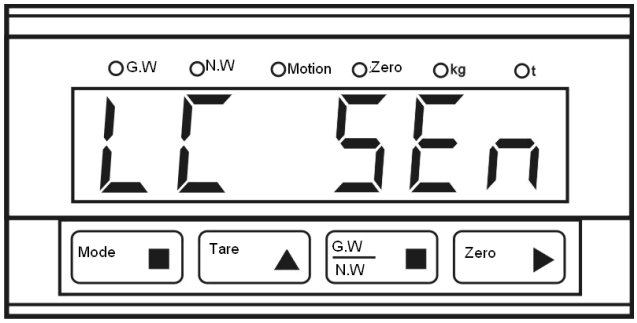
The indicator displays below 1 second later (the number is merely an example)



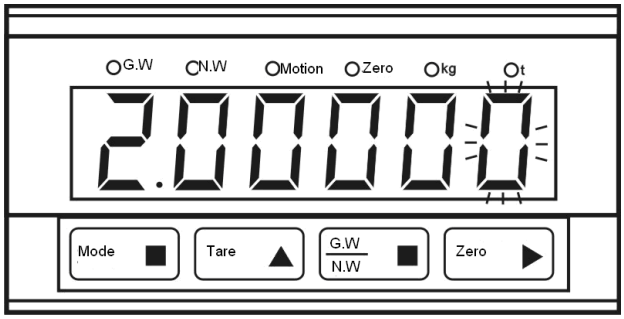
Press 【ZERO】to change the gleaming position, press【TARE】to add 1, input the overall capacity.

For example, if the measuring apparatus employs 4 load cells of 2000KG capacity each, the just input 8000. Press 【MODE】to enter into next step.

(7) Input sensitivity of the load cell.



The indicator displays below 1 second later (the number is merely an example)



Press 【ZERO】to change the gleaming position, press【TARE】to add 1, input the sensitivity of load cell. For example, “2.00000mV/V”. Press 【MODE】and the indicator will calculate the parameter, and displays the current weight. The parameter input process is finished by now.

Hint: after parameter input process, the scale weight can be removed through sole ZERO calibration.

As the sensitivity difference of the scale and load cell will bring forth phase angle difference,

it's hard to calibrate the scale input parameters accurately; thus the above method can only be used when it is hard to load poise in the scene and the weighing error is acceptable!!!

6.4 RS232/RS485 interface direct calibration

Under normal weighing condition, calibrate from RS232 interface, and input instruction "CAL 1<CR><LF>", the indicator displays "CAL1".

If the indicator address is not 00, the input instruction "<ENQ>IDXX<CR><LF>", the indicator shall return "<ACK>XX<CR><LF>", the input instruction "CAL 1<CR><LF>", the indicator displays "CAL1".

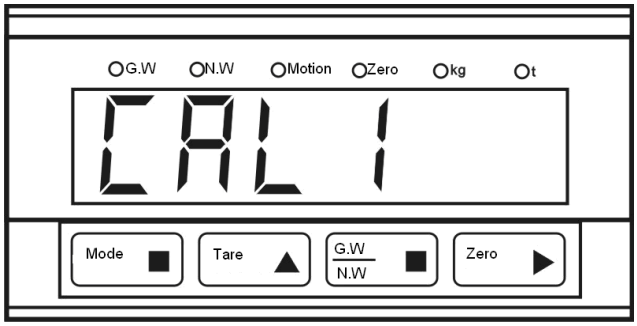
Input: 43 41 4c 20 31 0d 0a

ASCII CAL 1<CR><LF>
Hexadecimal 43 41 4C 20 30 0D 0A

The indicator outputs,

ASCII YES<CR><LF>
Hexadecimal 59 45 53 0D 0A

The indicator displays:



6.4.1Division value setup

Input:

ASCII SETd 1<CR><LF> (take division value=1 as example)
Hexadecimal 53 45 54 64 20 31 0D 0A

The indicator outputs,

ASCII d= 1 <CR><LF>
Hexadecimal 64 3D 20 20 20 20 20 20 20 31 0D 0A

If d=0.01, input,

ASCII SETd 0.01<CR><LF>
Hexadecimal 53 45 54 64 20 30 2E 30 31 0D 0A

The indicator outputs,

ASCII d= 0.01 <CR><LF>
Hexadecimal 64 3D 20 20 20 20 30 2E 30 31 0D 0A

The division value can only be the integral power of 1, 2 or 5, such as 0.001, 0.002, 0.005, 0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1, 2, 5, 10, 20, 50; Otherwise, the indicator displays "NO?".

6.4.2 Rated capacity setup

Input,

ASCII SETCAP 10000<CR><LF> (take 1000 as example)
Hexadecimal 53 45 54 43 41 50 20 31 30 30 30 30 0D 0A

The indicator displays,

ASCII CAP 10000<CR><LF>

Hexadecimal 43 41 50 20 20 20 20 31 30 30 30 30 0D 0A

If there is decimal in the division value, the capacity of 100.00 is the same as 100's.

6.4.3 ZERO calibration

Input,

ASCII CAL ZERO<CR><LF>

Hexadecimal 43 41 4C 20 5A 45 52 4F 0D 0A

If it works, the indicator displays "YES", otherwise, it displays "NO?" (data are unstable)

6.4.4 Load calibration

Input, take 1000 as example,

ASCII SPAN 10000<CR><LF>

Hexadecimal 53 50 41 4e 20 31 30 30 30 30 0D 0A

If it works, the indicator displays

ASCII SPAN 10000<CR><LF>

Hexadecimal 53 50 41 4E 20 31 30 30 30 30 0d 0a

If the data is unstable, the indicator displays "NO?"; if the sensitivity is too small, it displays "Error5".

6.4.5 Return

Input,

ASCII R<CR><LF>

Hexadecimal 52 0D 0A

The indicator displays "YES", and quit out of calibration, displays the current weight.

7 Comparative parameter setup

（1）No matter it displays anything or not, it displays the gross weight value.

（2）Every press of 【ZERO】, the indicator will accumulate from low-order to high order (from 10^0 to $10^{4)}$.

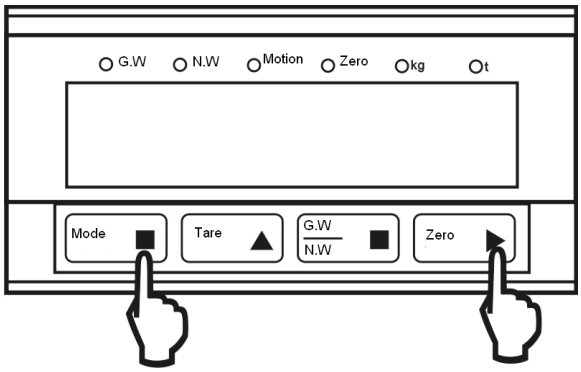
Every press of 【TARE】, the indicator will accumulate from 0 to 9.

（3）Through the display, you can check the set data (from HH to LL) one by one.

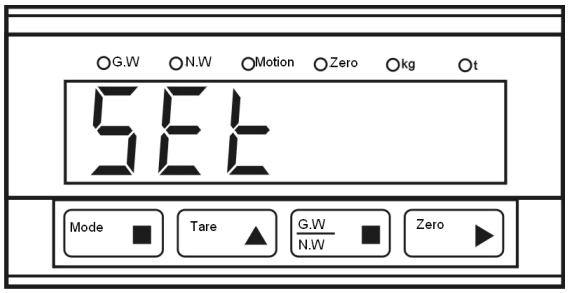
	●	●	●	●
The display:	GW	NW	Dynamic	ZERO
Comparative parameter:	HH	HI	LO	LL
	(Ultra-high)	(High)	(Low)	(Ultra-low)

7.1 Setup through keystoke

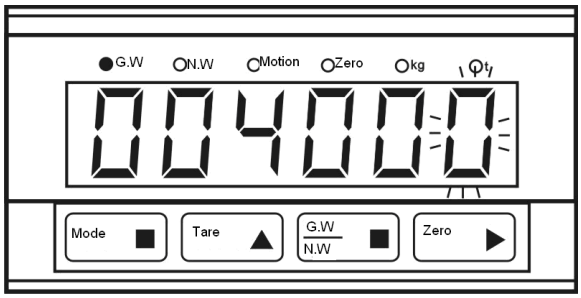
Enter into comparative parameter setup: press 【MODE】and【ZERO】 simultaneously, it displays "SET" 2 seconds later,



It displays below 2 seconds later,



It displays below 2 seconds further later,

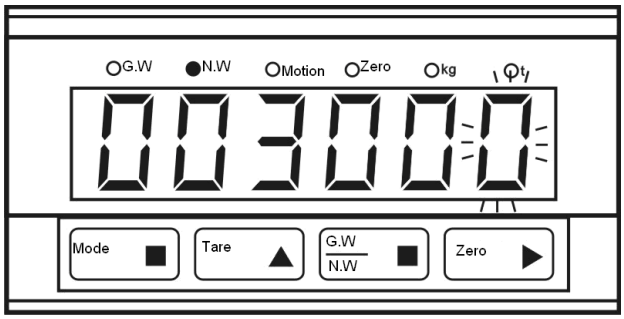


7.1.1 Ultra-high value setup (HH)

When the “GW” light lights up, the set value is the ultra-high value; press【ZERO】to choose digit and press【TARE】to set this value.

Press【MODE】to confirm the value and enter into the second calibration step.

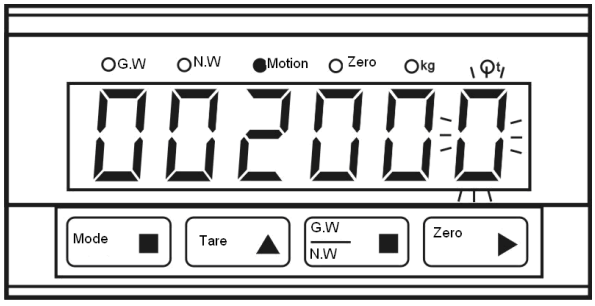
7.1.2 High value setup (HI)



When “NW” light lights up, the set value is high value, press 【ZERO】to choose digit and press【TARE】to set this value.

Press【MODE】to confirm the value and enter into the third calibration step.

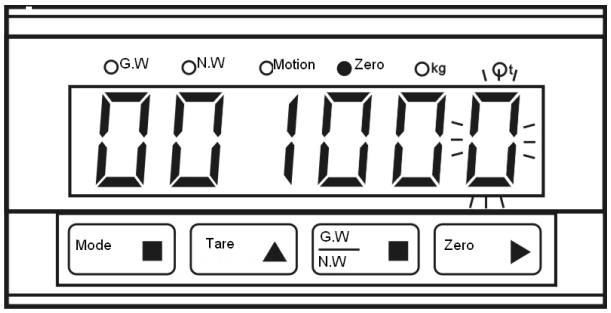
7.1.3 Low value setup (LO)



When Dynamic light lights up, the set value is the low value. Press【ZERO】to choose digit and press【TARE】to set this value.

Press【MODE】to confirm the value and enter into the fourth calibration step.

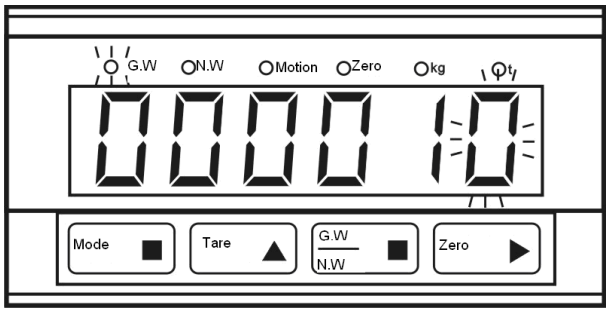
7.1.4 Ultra-low value setup (LL)



When “ZERO” light lights up, the set value is the ultra-low value. Press 【ZERO】to choose digit and press【TARE】to set this value.

Press【MODE】to confirm the value and enter into the fifth calibration step.

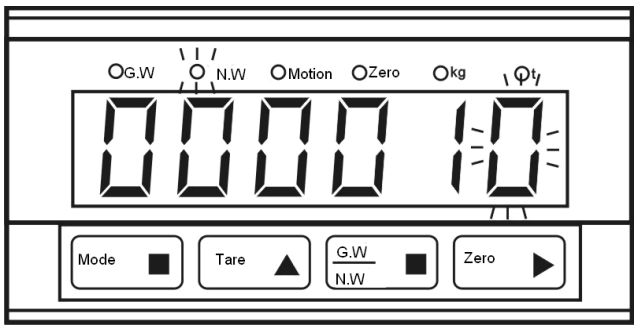
7.1.5 Lagged Ultra-high value setup (HH-S)



When the “GW” light lights up, the set value is the lagged ultra-high value; press【ZERO】to choose digit and press【TARE】to set this value.

Press【MODE】to confirm the value and enter into the sixth calibration step.

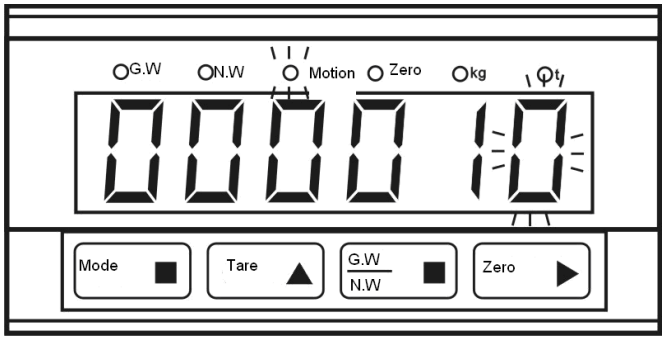
7.1.6 Lagged High value setup (HI-S)



When “NW” light lights up, the set value is lagged high value, press【ZERO】to choose digit and press【TARE】to set this value.

Press【MODE】to confirm the value and enter into the seventh calibration step.

7.1.7 Lagged Low value setup (LO-S)

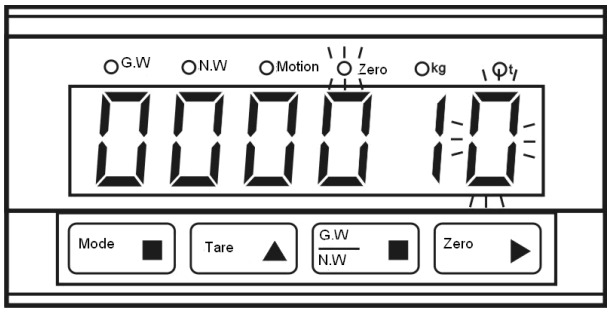


When Dynamic light lights up, the set value is the low value. Press 【ZERO】to choose digit and press 【TARE】to set this value.

Press【MODE】to confirm the value and enter into the eighth calibration step.

7.1.8 Lagged Ultra-low value setup (LL-S)

When “ZERO” light lights up, the set value is the ultra-low value. Press 【ZERO】to choose digit and press【TARE】to set this value.



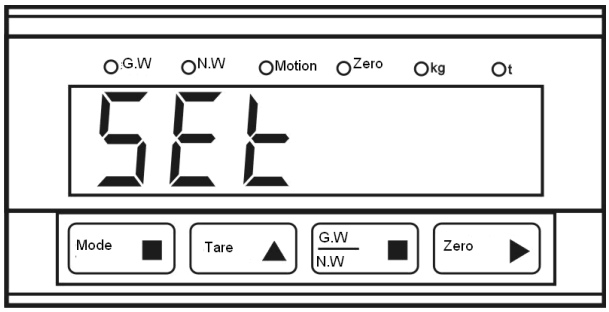
Press 【MODE】 to confirm the value and quit out. If it returns to the Ultra-high value interface, it means the data is not correct and need re-setup. Ensure that ultra-high value ⩾ high value ⩾ low value ⩾ ultra-low value.

Note: the lagged value could be set as 0 which equal to that no lagging function.

7.2 Setup through RS232/RS485 (Available in RS232 / RS485 equipped indicator)

In normal weighing condition, set through RS232, input instruction “SET<CR><LF>”, the indicator displays “SET”.

If the indicator address is not 00, please input instruction “<ENQ>IDXX<CR><LF>”, the indicator outputs “<ACK>XX<CR><LF>”; then input instruction “SET<CR><LF>”, it outputs “SET”.



Input:

ASCII	SET<CR><LF> (take 1000 as example
Hexadecimal	53 45 54 0d 0a

The indicator outputs,

ASCII	YES<CR><LF>

Hexadecimal	459 45 53 0D 0A

7.2.1 Ultra-high value setup (HH)

Input,

ASCII	SET HH 4000<CR><LF> (take 4000 as example)
Hexadecimal	53 45 54 20 48 48 20 34 30 30 30 0d 0a

The indicator outputs,

ASCII	HH= 4000<CR><LF>
Hexadecimal	48 48 3D 20 20 20 20 34 30 30 30 0D 0A

Read the untra-high value:

Input instruction “READ HH <CR><LF>”, the indicator outputs in the same format as HH value set.

7.2.2 High value setup (HI)

Input,

ASCII	SET HI 3000<CR><LF> (take 4000 as example)
Hexadecimal	53 45 54 20 48 49 20 33 30 30 30 0d 0a

The indicator output,

ASCII	HI= 3000<CR><LF>
Hexadecimal	48 48 3D 20 20 20 20 33 30 30 30 0D 0A

Read the high value, input instruction “READ HI <CR><LF>”, the indicator outputs in the same format as HI value set.

7.2.3 Low value setup (LO)

Input,

ASCII	SET LO 2000<CR><LF> (take 2000 as example)
Hexadecimal	53 45 54 20 4C 4F 20 32 30 30 30 0d 0a

The indicator output,

ASCII	LO= 2000<CR><LF>
Hexadecimal	48 48 3D 20 20 20 20 32 30 30 30 0D 0A

Read the low value, input instruction “READ LO<CR><LF>”, the indicator outputs in the same format as LO value set.

7.2.4 Ultra-low value setup (LL)

Input,

ASCII	SET LL 1000<CR><LF> (take 1000 as example)
Hexadecimal	53 45 54 20 4C 4C 20 31 30 30 30 0d 0a

The indicator output,

ASCII	LL= 1000<CR><LF>
Hexadecimal	48 48 3D 20 20 20 20 31 30 30 30 0D 0A

Read the ultra-low value, input instruction “READ LL<CR><LF>”, the indicator outputs in the same format as LL value set.

7.2.5 Lagged Ultra-high value setup (HH-S)

Input,

ASCII	SET HHS 10<CR><LF> (take 10 as example)
Hexadecimal	53 45 54 20 48 48 53 20 31 30 0d 0a

The indicator outputs,

ASCII	HHS= 10<CR><LF>
Hexadecimal	48 48 53 3D 20 20 20 20 20 20 31 30 0D 0A

Read the HH-S value, input instruction “READ HHS<CR><LF>”, the indicator outputs in the same format as HH-S value set.

7.2.6 Lagged High value setup (HI-S)

Input,

ASCII	SET HIS 10<CR><LF> (take 10 as example)
Hexadecimal	53 45 54 20 48 49 53 20 31 30 0d 0a

The indicator outputs,

ASCII	HIS= 10<CR><LF>
Hexadecimal	48 4I 53 3D 20 20 20 20 20 20 31 30 0D 0A

Read the HI-S value, input instruction “READ HIS<CR><LF>”, the indicator outputs in the same format as HI-S value set.

7.2.7 Lagged Low value setup (LO-S)

Input,

ASCII	SET LOS 10<CR><LF> (take 10 as example)
Hexadecimal	53 45 54 20 4C 4F 53 20 31 30 0d 0a

The indicator outputs,

ASCII	LOS= 10<CR><LF>
Hexadecimal	4C 4F 53 3D 20 20 20 20 20 20 31 30 0D 0A

Read the LO-S value, input instruction “READ LOS<CR><LF>”, the indicator outputs in the same format as LO-S value set.

7.2.8 Lagged Ultra-low value setup (LL-S)

Input,

ASCII	SET LLS 10<CR><LF> (take 10 as example)
Hexadecimal	53 45 54 20 4C 4C 53 20 31 30 0d 0a

The indicator outputs,

ASCII	LLS= 10<CR><LF>
Hexadecimal	4C 4C 53 3D 20 20 20 20 20 20 31 30 0D 0A

Read the LL-S value, input instruction “READ LLS<CR><LF>”, the indicator outputs in the same format as LL-S value set.

7.2.9 Quit out setup process

Input,

ASCII	R<CR><LF>
Hexadecimal	52 0D 0A

The indicator outputs “YES”, quit out setup process, and display current weight. If it cannot quit out, please check the data, and ensure that ultra-high value $\geqslant$ high value $\geqslant$ low value $\geqslant$ ultra-low value.

Note: if there is decimal in the division value, the result of 100.00 and 100 is the same.

8 OUTPUT/INPUT

8.1 OUTPUT OF LOGICAL RELATION

8.1.1 Instruction of comparative conditions

1）When F19=0, F6=0, actually the GW comparing,
HH breakover output=GW＞HH set comparative value
HI breakover output =GW＞HI set comparative value
LO breakover output =GW＜LO set comparative value
LL breakover output =GW＜LL set comparative value

2）When F19=1, F6=0, actually the NW comparing,
HH breakover output=NW＞HH set comparative value
HI breakover output =NW＞HI set comparative value
LO breakover output =NW＜LO set comparative value
LL breakover output =NW＜LL set comparative value

3）When F19=2, F6=0, actually the weight display comparing, if it displays GW, then,
HH breakover output=GW＞HH set comparative value
HI breakover output =GW＞HI set comparative value
LO breakover output =GW＜LO set comparative value
LL breakover output =GW＜LL set comparative value
If it displays NW, then,
HH breakover output=NW＞HH set comparative value
HI breakover output =NW＞HI set comparative value
LO breakover output =NW＜LO set comparative value
LL breakover output =NW＜LL set comparative value

4）When F19=0, F6=1, actually GW comparing,
HH breakover output=GW＞HH set comparative value
HI breakover output =GW＞HI set comparative value
LO breakover output =GW＜LO set comparative value
LL breakover output =GW＜LL set comparative value

5）When F19=1, F6=1, actually NW comparing,
HH breakover output=NW＞HH set comparative value
HI breakover output =NW＞HI set comparative value
LO breakover output =NW＜LO set comparative value
LL breakover output =NW＜LL set comparative value

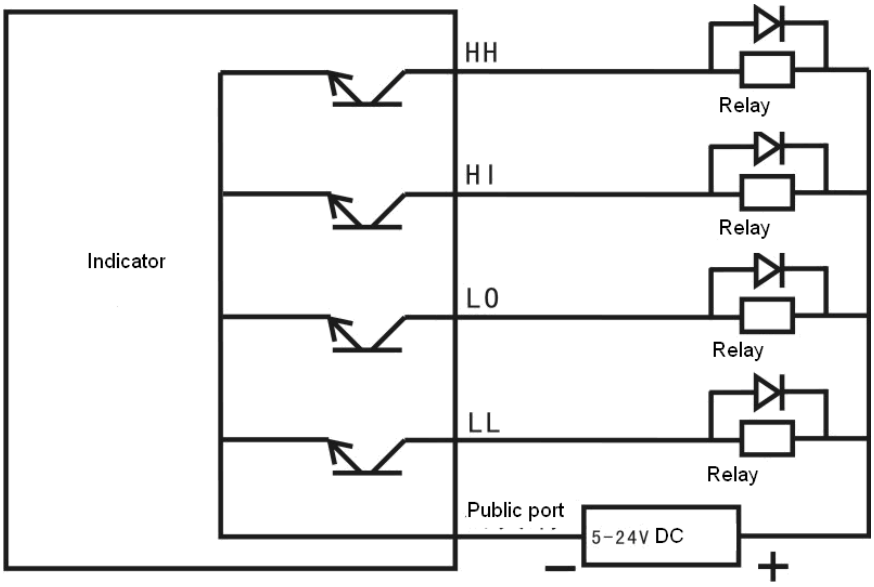
6）When F19=2, F6=1, actually the weight display comparing, if it displays GW, then,
HH breakover output=GW＞HH set comparative value
HI breakover output =GW＞HI set comparative value
LO breakover output =GW＜LO set comparative value
LL breakover output =GW＜LL set comparative value
If it displays NW, then,
HH breakover output=NW＞HH set comparative value
HI breakover output =NW＞HI set comparative value
LO breakover output =NW＜LO set comparative value
LL breakover output =NW＜LL set comparative value

8.1.2 Comparing rate

Can set through parameter F20; can reach 200 times per second at most.

8.1.3 Instruction of comparative output

HH: Ultra-high value output
HI: High value output
LO: Low value output
LL: Ultra-low value output
Common port



Can connect to 5~24 V DC, 0.3 A (max drive current). It's recommended to isolate external control facilities to avoid disturbing. DC powered relay must be parallel connected to diode to restrain any noise caused by spark (like above picture).

8.2 INPUT

8.1.1 Input function code and instruction

0=function setup allowed choose this code when the input pot is open, the function setup and rectification is locked. It can enter into function setup and rectification when the input port is short circuit.
The lock function is void when choosing any other code.

1=ZERO When optocoupler input is valid (short circuit 30ms), equal to 【ZERO】.

2=TARE When optocoupler input is valid (short circuit 30ms), equal to【TARE】.

3=GW/NW When optocoupler input is valid (short circuit 30ms), equal to 【GW/NW】.

4=PRINT When optocoupler input is valid (short circuit 30ms), can display through RS232/RS485 serial interface.

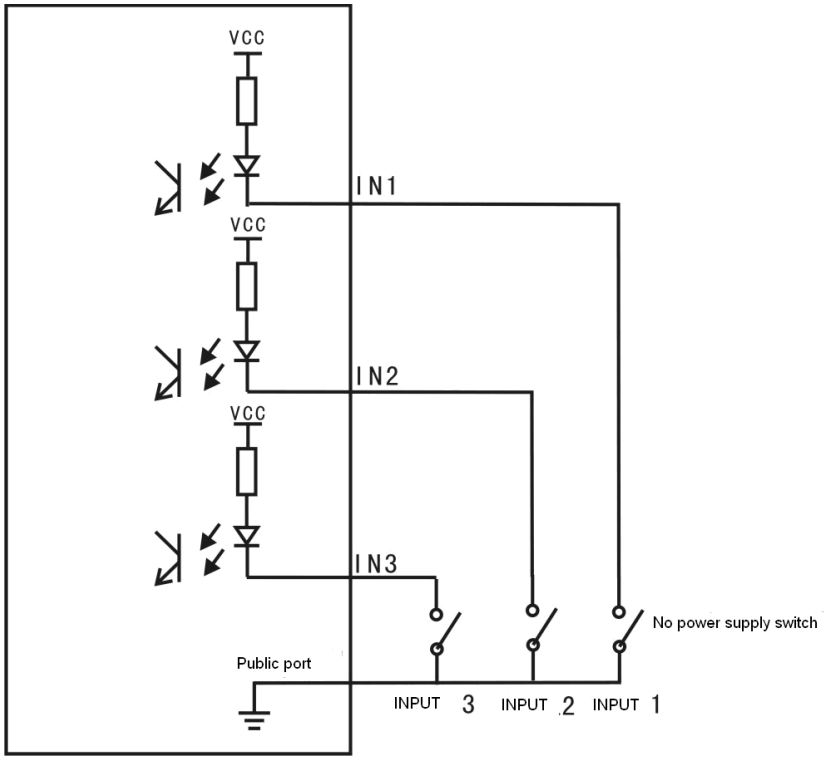
5=Peak Clear When optocoupler input is valid (short circuit 30ms), clear peak value (only in peak mode).

6=Display switch When optocoupler input is valid (short circuit 30ms), displays open or close.

7=Display value lock When optocoupler input is valid (short circuit 30ms), the measured current value will be kept until input is void.

8=Peak hold When F15=3, optocoupler input is valid (short circuit 30ms), hold the peak value; clear peak value when input is void.
WhenF15=4, optocoupler input is valid (instant short circuit, halt mode), hold the instant value, press 【MODE】to clear.

8.2.2 Input instruction



Note: employ passive switch in input contact, short circuit for 30ms.

8.3 RS232/RS485interface

8.3.1 RS232/RS485 character format

Baud rate: 2400，4800，9600 和 19200

Date bit: 7

Stop bit: 1

Parity bit: 1（EVEN）

Coding standard: ASCⅡ

8.3.2 Communication protocol

Continuous method:

（1）Continuous output the weight display.

（2）Set continuous output times through F13, can set 1、2、5、10、20 times；

20 times per second at most for baud rate 9600，19200.

10 times per second for baud rate 2400，4800.

（3）protocol

Serial number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Instruction	Condition 1		,	Condition 2		,	sign		Weighing value						unit		Control code	
Example	S	T	,	G	S	,	+			1	2	8	8		k	g	CR	LF

Condition 1： ST stable；US unstable.

Condition 2： NT net weight；GS gross weight.

Weighing value：use blank to replace the void perch.

Unit： kg or t。

Control code：CR，LF。

Instruction method：

commands 1：weight output

READ<CR><LF>

The indicator outputs

ST,GS,+ 1234kg<CR><LF>

commands 2：tare weight output

TARE<CR><LF>

The indicator outputs

TARE 12345<CR><LF>

commands 3：tare

TARE ON<CR><LF>

The indicator outputs

YES<CR><LF>或 NO?<CR><LF>

commands 4：clear tare weight (tare weight=0)

TARE OFF<CR><LF>

The indicator outputs

commands 5： tare weight set, lower than the maximum capacity

TARE XXXX<CR><LF>

The indicator outputs

YES<CR><LF> or NO?<CR><LF>

commands 6：ZERO

ZERO ON<CR><LF>

The indicator outputs

YES<CR><LF> or NO?<CR><LF>

commands 7： communicate through command mode, resume original setup when re-power-on

PROG<CR><LF>

commands 8： continuous output of weight date, resume original setup when re-power-on

CONT<CR><LF>

commands 9：function setup

FUNC<CR><LF>

commands 10：calibration

CAL 1<CR><LF>

commands 11：comparative setup

SET<CR><LF>

commands 12：return to weighing condition, along with FUNC、CAL and SET.

R<CR><LF>

commands 13： choose the indicator for set address

<ENQ>IDXX<CR><LF>

9 ANALOG OUTPUT INTERFACE PANEL (OPTIONAL)

Technical specification

Resolution：1/10000

Accuracy：0.1%FS

Output	0～10V	4～20mA

Load resistance	10KΩ min.	500Ω max.
Voltage/Current value when display=0	0V	4mA
Voltage/Current value when full scale	5V	20mA

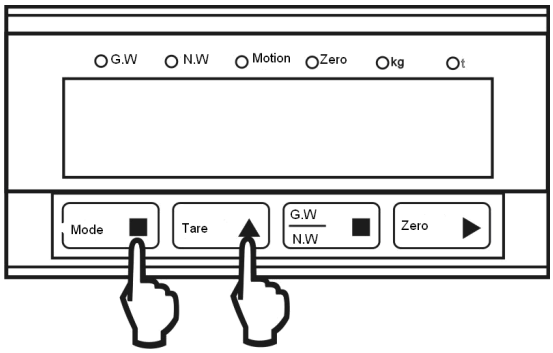
PIN instruction

COM：Analog output -

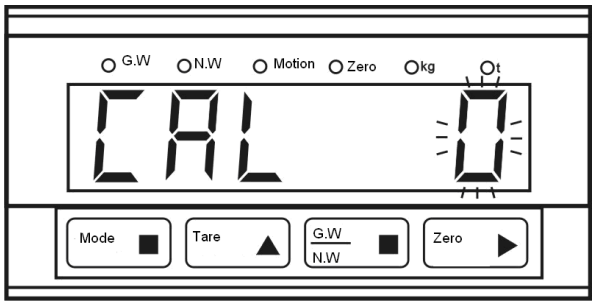
+ ：Analog output +

9.1 ANALOG ADJUSTMENT（4—20mA）

(1) Press【MODE】and【TARE】simultaneously, displays “CAL 0” 2 seconds later. The number could be 0, 1 or 2, which stands for the last correct calibration method. Must set F21=1.

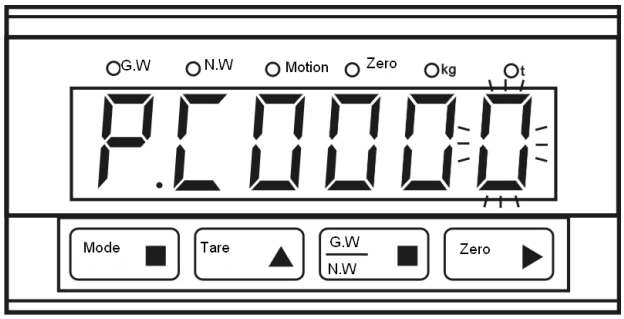


It displays below 2 seconds later,



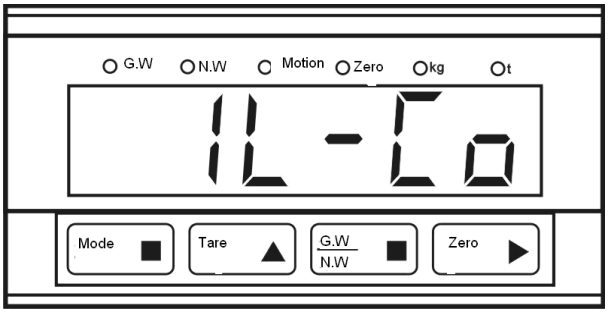
If it is not 2, press【TARE】to choose 3. If no analog panel, cannot choose 3.

(2) Press 【MODE】, display: input adjustment code.



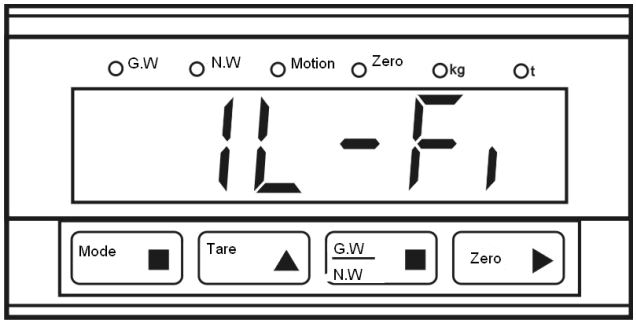
Press【ZERO】to change the gleaming position, press【TARE】to add 1, input keyword “0420”.

(3) Press【MODE】.



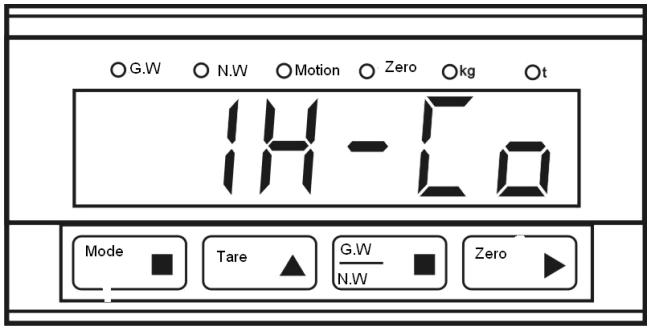
Rough adjustment of zero, press 【TARE】to enlarge, press 【GW/NW】to lessen.

(4) Press【MODE】.



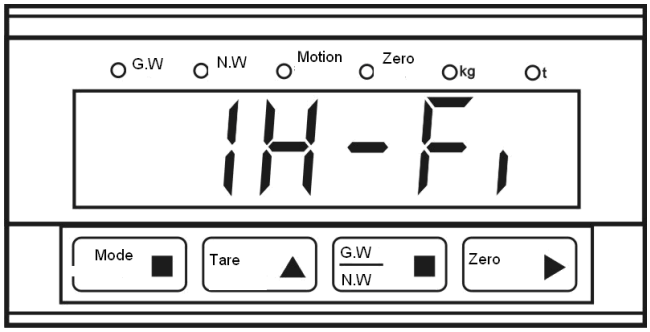
Fine adjustment of zero, press 【TARE】to enlarge, press【GW/NW】to lessen;

(5) Press【MODE】.



Rough adjustment of full scale, press 【TARE】to enlarge, press【GW/NW】to lessen;

(6) Press【MODE】.

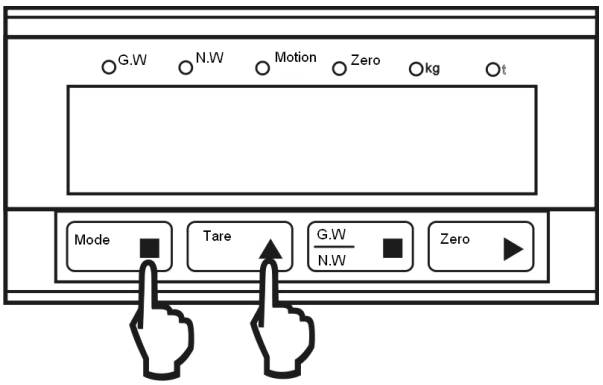


Fine adjustment of full scale, press 【TARE】to enlarge, press【GW/NW】to lessen;

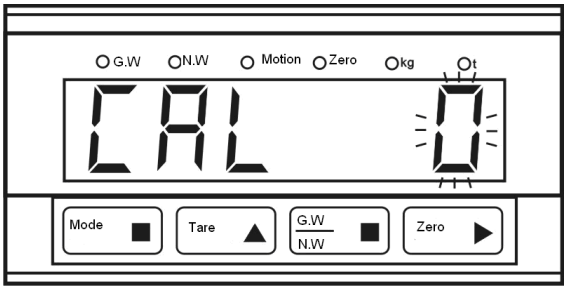
(7) Press【ZERO】to quit out.

9.2 ANALOG ADJUSTMENT（0—10V）

(1) Press【MODE】and【TARE】simultaneously, displays “CAL 0” 2 seconds later. The number could be 0, 1 or 2, which stands for the last correct calibration method. Must set F21=1.

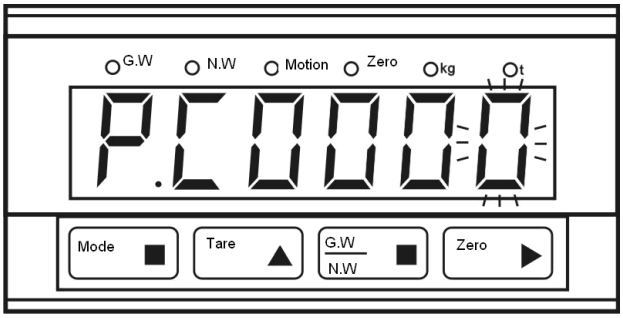


It displays below 2 seconds later,



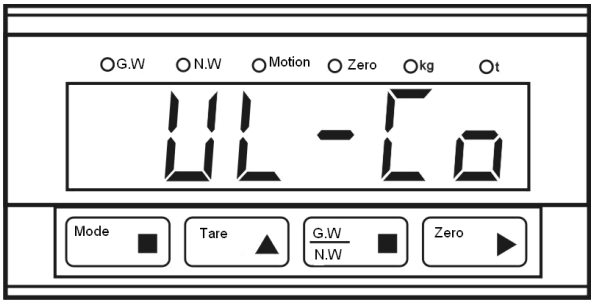
If it is not 0, press【TARE】to choose 3. If no analog panel, cannot choose 3.

(2) Press 【MODE】, display: input adjustment code.



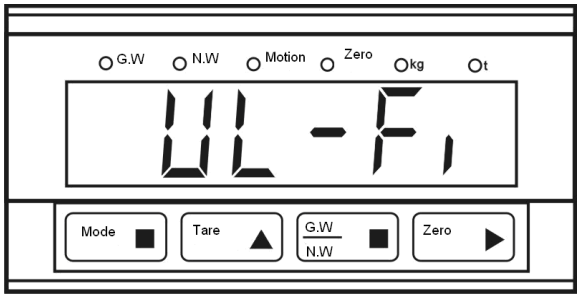
Press【ZERO】to change the gleaming position, press【TARE】to add 1, input keyword “0010”.

(3) Press 【MODE】.



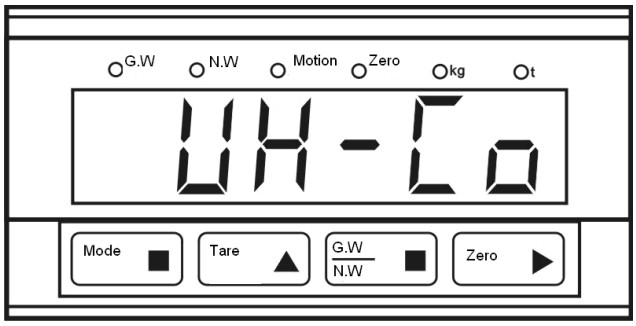
Rough adjustment of zero, press 【TARE】to enlarge, press【GW/NW】to lessen;

(4) Press 【MODE】.



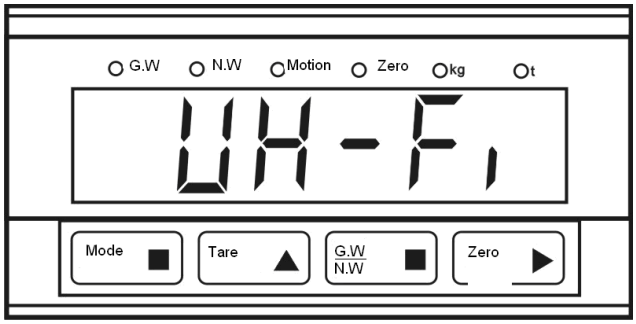
Fine adjustment of zero, press 【TARE】to enlarge, press【GW/NW】to lessen;

(5) Press 【MODE】.



Rough adjustment of full scale, press 【TARE】to enlarge, press【GW/NW】to lessen;

(6) Press 【MODE】.



Fine adjustment of full scale, press 【TARE】to enlarge, press【GW/NW】to lessen;

(7) Press【ZERO】to quit out.

Note: can obtain 0~5V or 0~20mA through adjustment.

10 LARGE SCREEN INTERFACE (ELECCTRIC CURRENT LOOP MANNER)

Baud rate: 600（fixed）

9 data bits, 1 start bit, 1stop bit, no rectification.

The first group data includes 2 frames data.

The first frame:

Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7	Bit8
小数点位置			0	0	0	G17	G16	0

The first frame data：sign bit is 0

Bit0、Bit1、Bit2---decimal (0-3）

G17，G16：the 16th, 17th bit of weight date.

The second frame:

Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7	Bit8
G8	G9	G10	G11	G12	G13	G14	G15	0

The third frame:

Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7	Bit8
G0	G1	G2	G3	G4	G5	G6	G7	1

G0~G17：18 binary code from low to high.

Connect to serial big screen from Keli (current loop mode)

Indicator	Big screen
D+	Second PIN of five aviation plug

D-	Fifth PIN of five aviation plug

FUNCTION		
FUNC S.N.	FUNC instruction	Factory faults
F0 （0）	Quit setup	F0=0
F1 （0—3）	Zero tracing time	F1=0 no trace

	Short circuit the first and four PINs.

APPENDIX FUNCTION LIST

F2	（0—3）	Zero tracing range	F2=0 0.5d
F3	（0—3）	Dynamic test	F3=2 3d second
F4	（0—3）	Power-on zero clear range	F4=0 auto zero clear forbidden
F5		Hold	none
F6	（0—1）	Switch output mode	F6=0 High-low limit
F7	（0—3）	Baud rate	F7=2 9600 baud rate
F8	（0—1）	RS232/RS485 output mode	F8=1 command mode
F9	（0—1）	Unit	F9=0 Kilogram
F10	（0—20）	ZERO set range	F10=4 4%FS
F11	（0—9）	Digital filtering	F11=4
F12	（0—4）	Updating rate display	F12=3 10 seconds every time
F13	（0—4）	Updating rate of serial interface	F13=3 20 seconds every time
F14	（00—99）	Indicate communication address	F14=02
F15	（0—4）	Peak hold	F15=0 No peak hold
F16	（0—8）	Input 1 function	F16=0 Function set allowed
F17	（0—8）	Input 2 function	F17=1 ZERO set
F18	（0—8）	Input 3 function	F18=2 Tare deduct
F19	（0—2）	Comparative conditions	F19=0 GW
F20	（0—10）	Average time of switch value comparing	F20=00 in-phase with display
F21	（0—1）	Analog mode	F21=1 Current 4-20mA
F22	（0—1）	Analog output condition	F22=0 GW
F23	（0—10）	Updating rate of analog output	F23=00 in-phase with display