3N-800 Industry Feeding Controller

Instructions

SUNEN Electronic Ltd.
(86) 536- 3152451

Catalogue

Chapter 1 System Introduce

return catalog

1.1 Specifications

1. System Control Precise ±0.5% (Including mechanic and electronics)
2. Controlling precise ±0.1%。
3. Maximum Capacity = 400 Ton/Hour
4. Control 16 Loop Scales，allowed divide into two (2) groups. Independent control.
5. With mill load interface and automatically feedback control.
6. RS485, PROFIBUS communication interface.
7. input signal: 16 channels loadcell 0~5V standard signal.
   16channels switch input, full optoelectronic isolation.
8. Speed signal: 0~1200Hz.
9. Output Signal: 16 channels 0-5V standard signal.
   16 channels switch output signal, full optoelectronic isolation.
10. Auto alarm, auto stop while alarm over a defined time section.
11. Password protect important parameter.
12. Variable Tare time section.
13. Ton pulse output.
14. The original password is 123456

Chapter 2 Screen

return catalog

2.1 Screen divide into 6 (six) areas

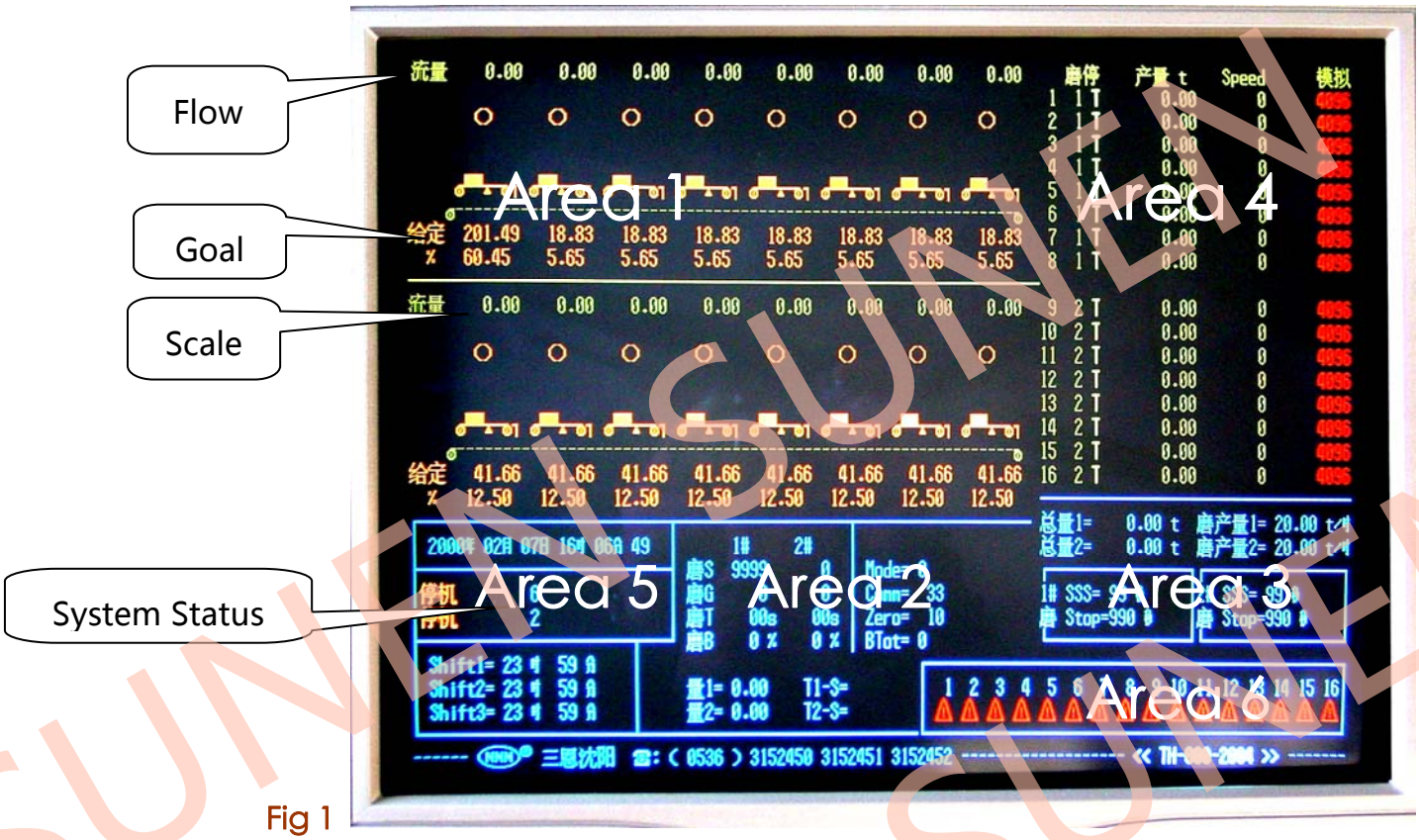


Fig 1

Area 1: Running Data

Goal = Set Target (for instance, 100Kg/Minute)

Flow = Real flow (for instance, 98.4), Unit same as Goal

Simulated diagram of Scale, with different color, Green (Running), Yellow (stop) and red (alarm)

Area 2: System Set Up

return catalog

Mill load area, normally not use, just for some particular customers.

S = real mill load

G = set mill load.

T = Adjustment interval, unit: Second

B = Adjustment percentage.

System parameters:

Mode : Control Way of Start/Stop, 0=Local, 1= Remote by communication net

Comm = communication address

Zero = Time section of Tare Procedure, unit: second

Btot: Accumulate Total yield. 0=always, 1= only while running.

Prt: Print. 0 = no, 1= automatically print and clear total.

Dis: Unit of Goal and Flow. 0 = Kg/Minute, 1= Ton/Hour

Btrace: Flow tracking Function. 0= Cancel, 1= Engage

BFlow: Minus Flow. 0= display 0, 1= Display minus flow

Area 3: Real Total yield, Set Total Yield.

SSS = measure cycle, only used in Lose-Weight System.

Stop = Stop delay while running alarm, Unit Second.

Area 4: Sub-Window

See Chapter 2.2 Sub-Window

Area 5

System working status (Running or Stop, or other performance), current time, total running time.

Area 6

All loops Alarm Display.

2.2 Sub-Window

return catalog

2.2.1: Sub-Window 1

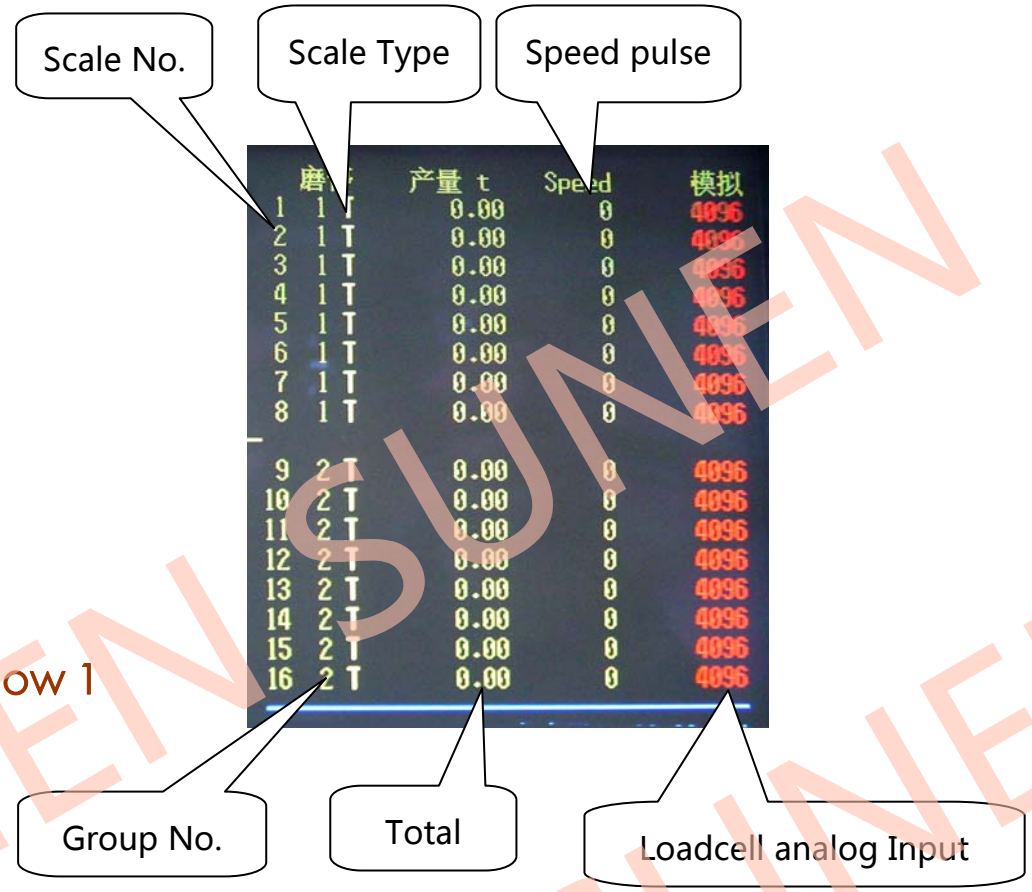


Fig 2 Sub-Window 1

Scale No.= Controlled scale number (1-16)

Group No.: 0= Not Use, 1= Group1, 2= Group 2

Scale Type : T= Speed controlled scale. H= Speed Constant Scale

Total: Total yield

Speed = Speed pulse input (0-2000Hz), When scale type=H, speed be constant.

Loadcell Analog Input = loadcell analog input (0-4095)

2.2.2: Sub-Window 2

return catalog

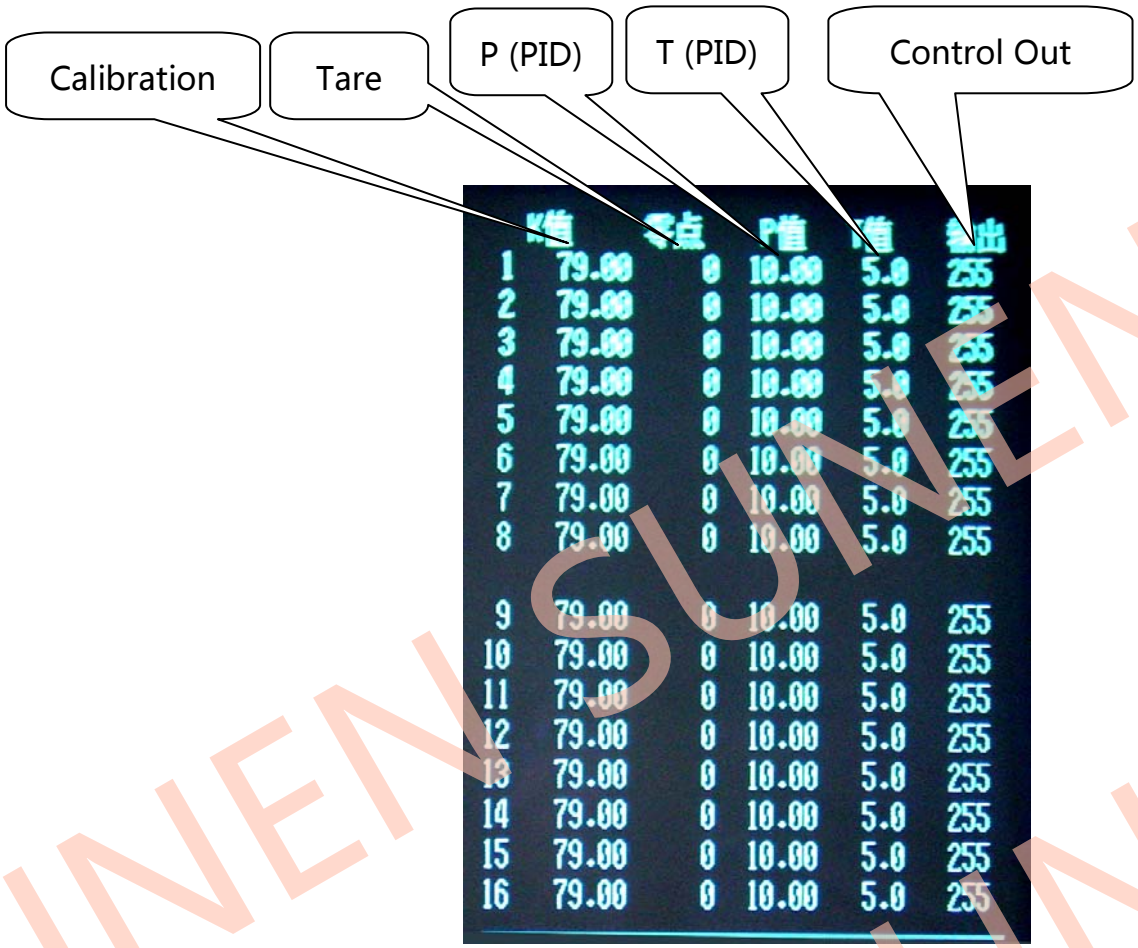


Fig 3 Sub-Window 2

1. Calibration

This parameter is Calibration coefficient. Its definition is the proportion between flow and loadcell input and speed input. It can be input from keyboard, also work out from calibration procedure.

2. Tare

This parameter is loadcell input when no materials on the belt. (0-4095)
It can be input from keyboard, also work out from Zero procedure.

3. P (PID)

return catalog

This parameter is proportion coefficient use in PID model and can be input from keyboard.

P-factor is proportion factor and determines the change scope of output regarding to the gap between the goal and real flow (see control output on sub-window 2). The larger this value, the better following characteristic with Control goal. Unreasonable large of this P-factor will result to the over-regulation and the output oscillation. Contrariwise, too small P-factor will drag down the trace paces and make the system difficult to get up to the Control Target.

4. T (PID)

This parameter is integral coefficient use in PID model and can be input from keyboard.

T-factor is integral factor and determines the change scope of output regarding to the gap between the real flow and last real flow (see control output on sub-window 2). The larger this value, the better stability of system. Unreasonable small of this T-factor will result to the frequently-regulation and the output oscillation. Contrariwise, too large T-factor will drag down the trace paces and make the system difficult to get up to the Control Target.

Note:

It is necessary that iteratively modify the P and T value is to guarantee the smallest rebound of the real flow around the Control Target.

If the fluctuating flow result from the mechanic problem, it is useless to modify the P and T factor.

It must be done to re-define the P and T value in case the mechanical alter.

P and T value is the key of the control precise. Make sure to determine the appropriate P and T.

5. Control Output (0-255)

This parameter is control output value. This value transform into 0-5v signal control actuator, for instance, frequency converter.

This parameter can be input from keyboard and varied automatically by control model while system is running.

2.2.3 Sub-Window 3

return catalog

Help Menu

Fig 4 Sub-Window 3

F1= Group 1 start/Stop, press to start and press again to stop.

F2= Group 2 start/Stop, press to start and press again to stop.

F3= Modify parameters. F4= Setting Time

F5= Print Total Report F6= Calibration Procedure

F7= Select Group F8= Setting Material name

F9= Group 1 Clear Press F9,6,8 at same time, clear group 1 total yield

Press F9,6,9 at same time, clear group 1 running total time(minute)

F10= Group 2 Clear Press F10,6,8 at same time, clear group 2 total yield

Press F10,6,9 at same time, clear group 2 running total time(minute)

PgUp= Switch over sub-window (1-3) N= Start/Cancel mill 1 load control model.

PgUp= Switch over sub-window (3-1) M= Start/Cancel mill 2 load control model.

F11= Tare Procedure Q=Define Scale Type (H or T)

Chapter 3 Keyboard

return catalog

3.1 F1 —— Group 1 start/stop

Press F1 while group 1 in stop situation group 1 will start running.

Press F1 while group1 in running situation group 1 will stop running.

3.2 F2 —— Group 2 start/stop

Press F2 while group 2 in stop situation group 2 will start running.

Press F2 while group 2 in running situation group 2 will stop running.

3.3 F3 —— Modify Parameters

Press F3, enter modify mode, cursor flash at first common parameter. Move cursor into the parameter that need to be modified and input new value from keyboard. If need to modify protected parameter, press F12, password input frame appear, input correct password, then can move cursor to all protected parameters.

Key Enter must be entered to finish the new value and the new value become valid.

Press F3, cursor switch over each area to make it easy to get wanted parameter.

3.4 F4 —— Modify Time Clock

1. System must be stop situation.

2. Press F4, a password input frame appears, input correct password, password input frame disappear and a cursor flash at clock area year item.

3. Input the new year value, press key enter, cursor will jump the month item, finish input new month value with key enter, cursor will jump day item, and go on till finish all item input.

3.5 F5 —— Print Report

return catalog

1. If it is first time, define all scales' material name (Limit to 3 characters).
2. Connect Printer, load paper, turn on power, make sure online indicator is on.
3. Press F5.
4. How to define the material name (for example, limestone, define into LIM)
   a. Press F3, enter modify mode.
   b. Press F8, a frame like below will appear.

1. XXXX XXXX XXXX
2. XXXX XXXX XXXX
3. XXXX XXXX XXXX
4. XXXX XXXX XXXX
.. ..
14. XXXX XXXX XXXX
15. XXXX XXXX XXXX
16. XXXX XXXX XXXX

Scale No. 4 digit Hex（123456789ABCDEF）,representative a character

5. Move cursor into the position, check up the code table that provided by printer supplier to find out the corresponding code and input on keyboard.
6. Press ESC key to finish the setting and the frame disappear.

Note:

Do not press PgUp and PgDn key to switch page during printer is working.

3.6 F6 —— Calibration Procedure

Calibrate Factor is a value that is needed to calculate the quantity of material passing through the weighing section in a piece of time. This factor directly determines the precise. So it is strongly asked that Calibrate Factor must be turned out by Calibrating Procedure before the feeder put in operation. And it is also strongly asked that Calibrate Procedure must be carried out after every time mechanical alteration happened.

Details of the procedure see Chapter 4 <Calibration procedure>

3.7 F7 —— Select Group and Online

return catalog

1. System must be Stop situation and Sub-Window 1 on the screen, Press key <F7>, Password input frame appear.
2. Input correct password, Password input frame disappear and cursor flash on the position of <group no.>.
3. Key [↓] change the number of the current scale, 0=no use, 1=group 1, 2=group 2
4. Key [→] change the scale line.
5. Key [ESC] quit the function, cursor off.

3.8 F8 —— Define Material Name

1. Press Key [F8], Password input frame appear.
2. Input correct password, password input frame disappear and cursor flash on the first scale diagram.
3. Key [↓] change material name of flash scale according the order of below table.

Table 1		Table 2	
()			
孰料	Clinker		
混合料	Mixture		
石膏	Gypsum		
石灰石	Limestone		
矿渣	slag		
粉煤灰	Fly ash		
1#料	1#		
2# 料	2#		

4. find out needed material name, then key [→] go to next scale.
5. Key [ESC] quit the function, cursor off.

3.9 F9 —— Group 1 Clear

return catalog

1. To clear total yield of group 1, Press key F9 ,then press key 6, then press key 8.
2. To clear running time of group 1, Press key F9 ,then press key 6, then press key 9.

3.10 F10 —— Group 2 Clear

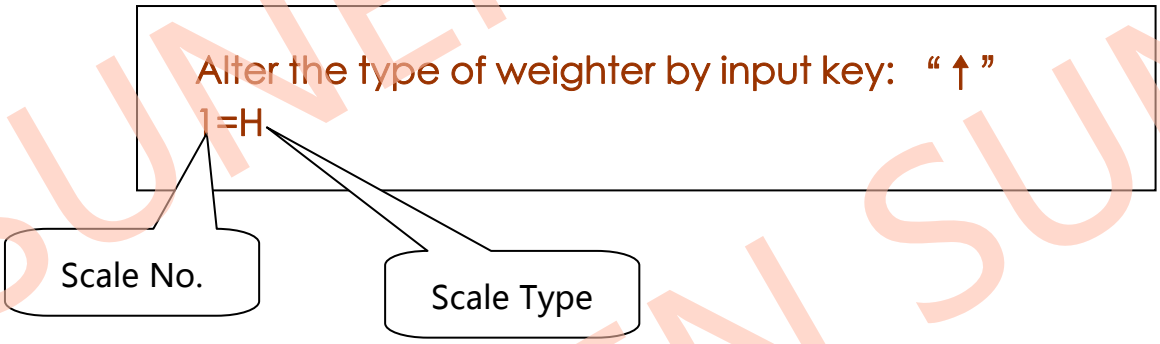
1. To clear total yield of group 2, Press key F10 ,then press key 6, then press key 8.
2. To clear running time of group 2, Press key F10 ,then press key 6, then press key 9.

3.11 PgUp、PgDn —— Switch Window

3.12 N、M —— mill Load control (no use)

3.13 Q —— Define Scale Type

1. System be in stop situation.
2. Press Key Q, Password input frame appear.
3. Input correct password, password input frame disappear and a dialog frame appear below:



4. Key ↑ change the type of current scale. H=Speed Constant Scale
   T=Speed Controlled Scale.
5. Input key Enter,dialog frame change below, define next scale.

5. Key ESC quit the function, Frame disappear.

3.14 Setting Time section of Tare Procedure

The parameter Zero determinates the time section of tare procedure and input from keyboard. It is better to define the value be correspond to time that the belt will go through the entire circles.

This defined section is longer, the accuracy is higher.

3.15 F11 —— Tare Procedure

return catalog

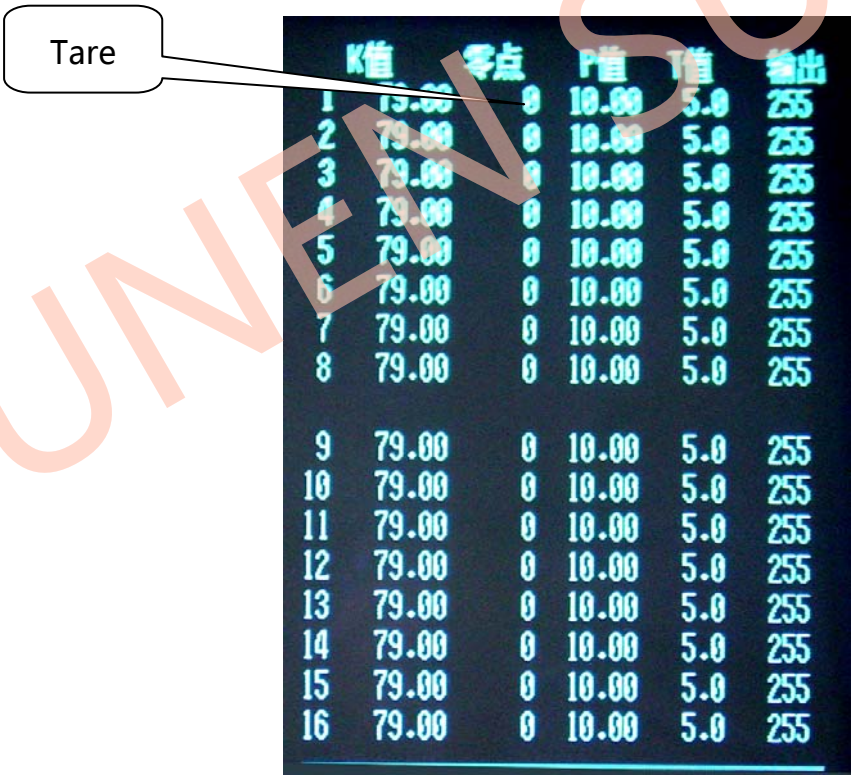
This procedure must be done before calibration procedure.

Before this procedure:

1. System is in Stop situation.
2. Make sure no materials and sundries on the belt and tap the belt edge on weighing section of belt to relieve the stress of belt.

Detail of the procedure:

1. Switch window into sub-window 2
2. Press F3, enter the parameter modify function.
3. Press F12, password input frame appear.
4. Input correct password, password input frame disappear.
5. Input key F3 repeatedly to make cursor move to sub-window2.
6. Move cursor to the position of <Tare> of needed tare scale.



8. Press key F11 to start the tare procedure and cursor flash off. The rest seconds of procedure display on Area 5.

9. When the time section runs out, tare procedure end and new tare value display, the modify cursor flash again.

10. If it is needed to finish the procedure halfway, press key Enter to end the procedure. The new tare value display, the modify cursor flash again.

11. Except key Enter, No other keys can be responded during the tare procedure.

12. It is not allowed to touch the scale body during the whole procedure.

13. Key ESC quit the function, Frame disappear.

14. With correct tare value, when no materials on the belt, the flow should be or almost be 0.0. If flow is unreasonable change, below items should be check on.

a. Scale body vibrating strongly.

b. Scale body need to be lubricated.

c. The belt touches other parts of scale body during belt running.

d. The belt deform and uneven.

e. The loadcell not fixed well.

f. The wire of loadcell not firmly connected and not shield well.

15. The right tare value should between 250-1200.

3.16 F12 —— Input and Reset Password

1. System is in stop situation. Press key F12, below dialog frame appear.

```
Old Password:
```

2. Input 6 bits of old password. The first time, it is **123456.**

```
Old Password:   ******
New Password:
```

3. Input 6 bits of numerical characters one by one.

```
Old Password:   ******
New Password:   ******
New Password Again:
```

4. Input new password again.

```
Old Password:   ******
New Password:   ******
New Password Again:   ******
Confirmed !!, Input CR
```

5. Press Enter, new password comes into effect.

6. Key ESC quit the function, old password still working.

return catalog

Chapter 4 Calibration Procedure

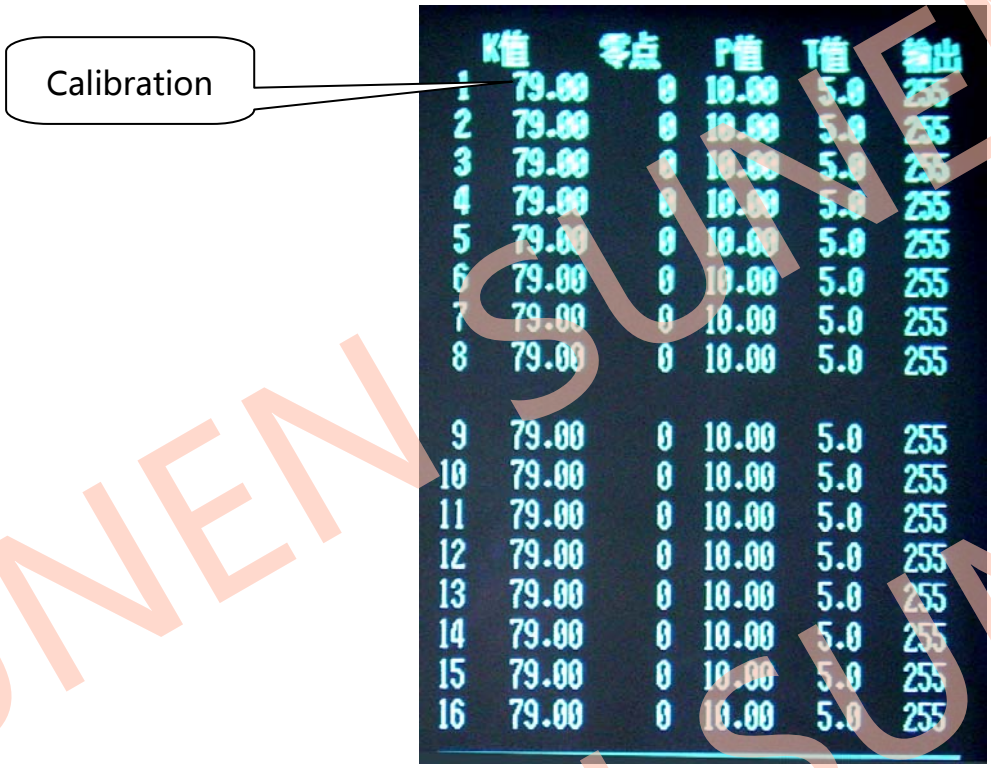
4.1 Before calibration procedure:

return catalog

1. System is in Stop situation.

2. The Tare procedure must have been done.

3. If it is the first time, preset calibration value =150 (for speed constant scale) or=200(for speed controlled scale).



4.2 Prepare for Calibration

5. Press key PgUp to switch window into sub-window 2

6. Press F3, enter the parameter modify function.

7. Press F12, password input frame appear.

8. Input correct password, password input frame disappear.

9. Input key repeatedly to make cursor move to sub-window2

10. Move cursor to the position of <Calibration> of needed to do calibration scale.

11. Press F6 to start the procedure. The analog of loadcell display at cursor position, it should be same as tare value.

4.3 Materials Calibration

12. If the scale is speed controlled type, control inverter to make belt running and make materials cover the whole belt. Then stop belt immediately when material is about drop away from belt.

13. Press key Enter , start accumulate material quantity. This Quantity will display at cursor position, it should be 0. And same time, start running belt and control feeding materials and collect the materials that drop away belt with a container.

14. When the quantity accumulate enough (that depends on the capacity of scale, the larger quantity, the better measure precise), control the feeding stop. The materials on belt continue to drop into container.

15. When all materials go into container, press key Enter to stop accumulate.

16. Measure the net weight of materials in the container. Input the weight from keyboard.

17. Check up the input correct and press key Enter. The new calibration is displayed.

18. Check up the new calibration value, make sure it is reasonable, press key Enter again to accept the new calibration value. Or press key ESC to ignore the new value.

20. Move the cursor to another scale line, do calibration for next scale.