Contents

CAUTION

.This is not a toy. Keep out of reach of children;

.This controller is not an explosion proof device;

.This controller is not a water proof device;

.Do not open this controller, no user serviceable parts inside. Always contact supplier for service.

1. Introduction of Product

1.1 About us

GSI305C is a weighing display control instrument of the belt conveyor type which is designed for a continuous cumulative automatic weighing scale (belt scale). It can be used to determine and accumulate the mass of bulk materials conveyed by belt weighing scales, belt batching scales, quantitative feeders, etc. through continuous automatic weighing. During the weighing process, real-time control of the feeding flow or batch size can be implemented.

The product absorbs and use for reference of advanced electronic weighing technology from abroad, combined with the production and management practices of domestic application enterprises, and has complete independent intellectual property rights. It is the most widely used and high-precision weighing display control instrument which is highly praised by domestic and foreign customers and has been widely used in the measurement and ingredient control process of bulk materials in industries such as power, coal, metallurgy, mining, ports, chemical industry, building materials, etc.

The instrument is equipped with an LCD display screen. The interface is intuitive and easy to operate.

This manual applies to controlling systems equipped with conveyor blet.

1) Weigh feeder
   Control of feed rate via belt speed
2) Staple continual-produce feeding belt weigher
   Include impeller feeding spiral scale, hopper conveying belt scale, disk feeding belt scale
3) Belt weigher with controlled prefeeder
   Control of belt load via belt speed

1.2 Function Features

1.2.1 Full Chinese or English menu interface and function prompts, intuitive interface.

1.2.2 Full numeric keyboard, easy menu operation and parameter setting.

1.2.3 Equipped with interface of digital switching and analog, easy to connect with Host computer to form DCS system and realize remote control operation.

1.2.4 Adopting a variety of standard communication protocols such as MODBUS and equipped with corresponding communication interfaces which makes it convenient to use FIELDBUS technology to form FCS system, and realize system digitization.

1.2.5 Standard configuration includes 1 channel of RS232 and 1 channel of RS485, which supports MODBUS-RTU protocol, and can also be connected to a printer.

1.2.6 Optional with 1 Ethernet port, 100Mbps, supporting MODBUS-TCP protocol.

1.2.7 Adopting a combination of FLASH and RAM mode to store data which can automatically save various process data when the system is powered off. And can keep running on the

original process parameters when the system is re-power.

1.2.8 Provide linearization correction for system weighing and zero point correction for daily real-time operations to ensure accurate and long-term stability of weighing.

1.2.9 Intelligent PI regulation can realize accurate flow control.

1.2.10 With real-time promt, query, events alarm function for system operation information and events information.

1.2.11 Adopting industrial grade highly reliable component and advanced anti-interference technology, which has extremely high anti-interference ability against static electricity, sparks, electromagnetism, etc.

2. Technical Data

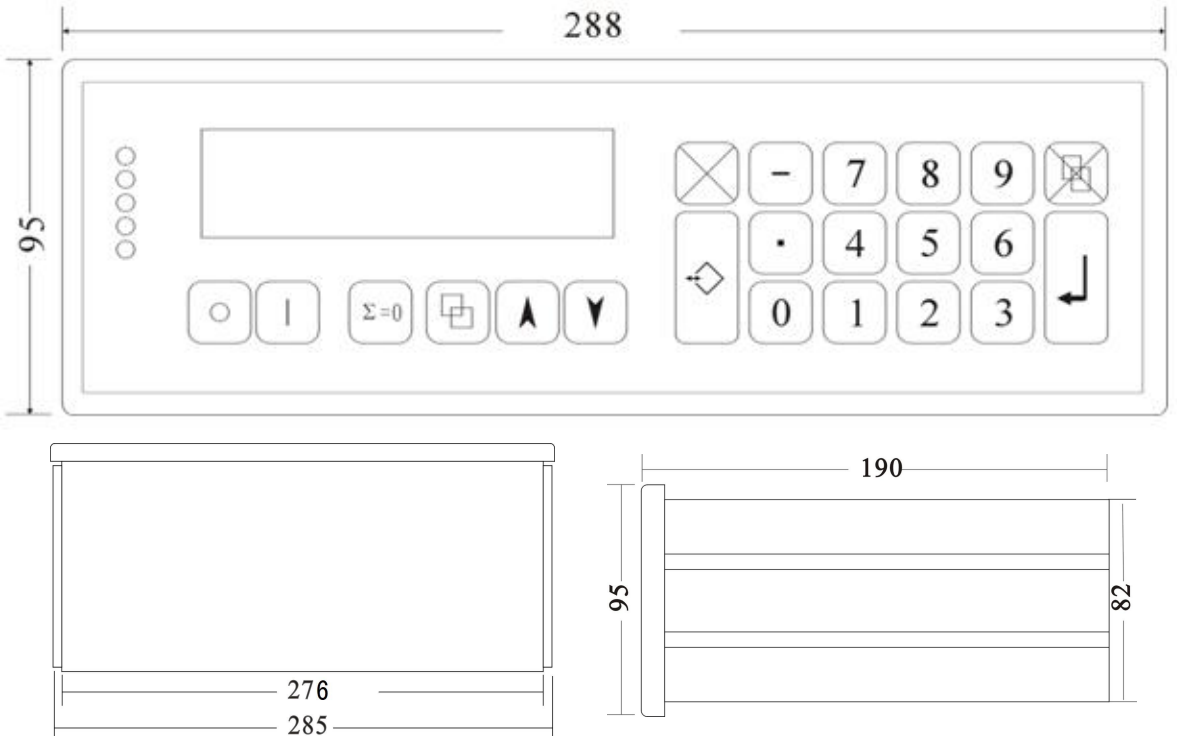
2.1 Parameters

Basic parameters	
Model	GSI305C
Display window	160*32 LCD screen,with word heights of 6mm and 10mm respectively
Dimension	288(W) x 190(D) x 95(H) mm
Weight	About 2.5 Kg
Working conditions	
Ext.Power supply	AC 220V (AC175-285V), 50Hz/60Hz
Power	＜30W
Working temperature	-10～40℃
Humidity	≤90%RH
Weight performance	
Linearity	0.01FS
Accuracy	0.1%
Tolerance	0-99999900 t
Range of flowrate display	0.0020-99999.9 t/h
Division	0.001kg, 0.01kg, 0.1kg, 1kg, 0.01t, 0.1t, 1t…
Working parameters	
Load cell excitation	DC 10V, 200mA
Max range of singal input	-28~285mV
Load cell type	Resistance strain
Speed sensor	DC24V, 50mA
Speed pulse	0.5-3000Hz
Speed sensor type	Optical /Magnetic /Hall sensor/ proximity switch
Analog Input	0-20mA, setting the flow signal by DCS interface
Analog Output	0-20mA, 2 Ports 1 Port for measure signal (Flow, speed, load signal optional) 2 Port for control signal (control the feeding speed)
Digital Input	DC 24V, 3 routes Passive touch signal 1 route: external error confirmation, effective when closed 2 route: external control for stop signal 3 route: external control for start signal
Digital Output	AC 220V, 3A, 7 routes 1 route: maximum value signal 2 route: minimum value signal 3 route: fault alarm

	4 route: start signal 5 route: flow deviation overrun signal 6 route: pre-start signal 7 route: remote set indicator signal
Accumulated pulse output	Output pulse according to selected measurement unit Frequency<10Hz width 50-1000ms
MODBUS Interface:	RS232<=1.5m RS485<=1000m Baud rate: 4800/9600/19200/38400/57600/115200 (default value:9600) MODBUS FIELDBUS technology
Ethernet (Optional)	100Mbps, supporting Modbus-TCP protocol

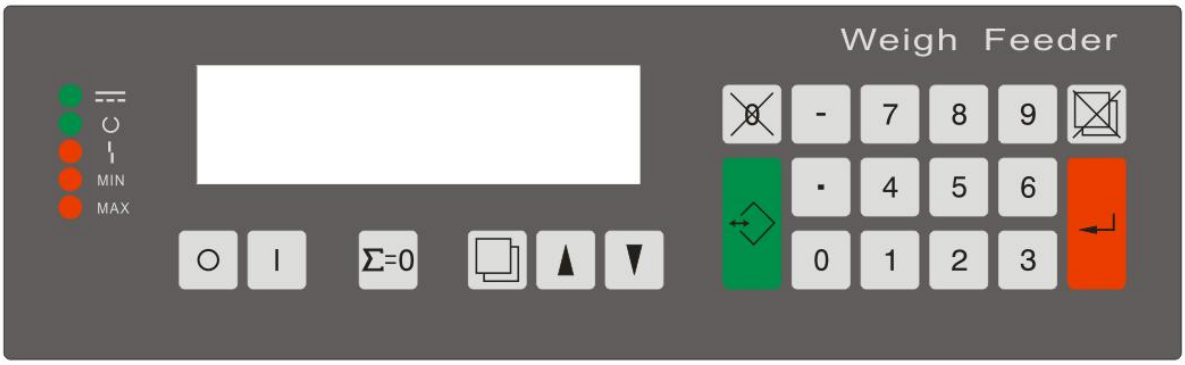
2.2 External dimensions

Unit:mm



2.3 Diagram Of Panel

Front panel



High-definition LCD screen, English display. Character: 5x7 8x16

The left side of the instrument panel has five LED lights:

- Green ON: Normal
- Green ON: self-test normal
- Red Blinking: alarm event
- MIN Red ON: flow below lower limit. (Optional speed or load)
- MAX Red ON: flow is higher than upper limit. (Optional speed or load)

Keyboard: Flexible membranes with tactile touch

Start/stop

Reset counter

Enter System Menu

Up/down Preselect lower display/ Select functions

DEL Acknowledge event message/ Delete input

ESC Abort function, means Interrupting input, Exiting to previous menu

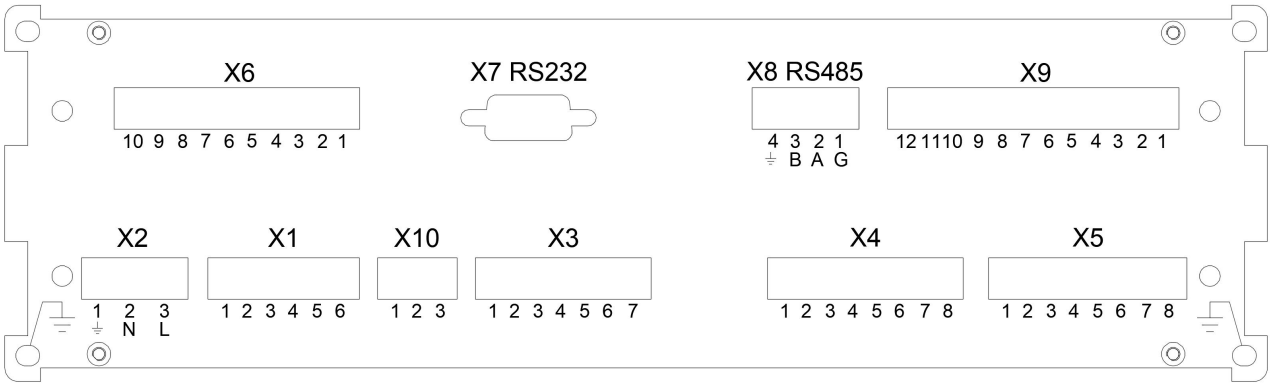
DAT Activate cursor, Prepare input, e.g. of setpoint

ENT Start function, Acknowledge input

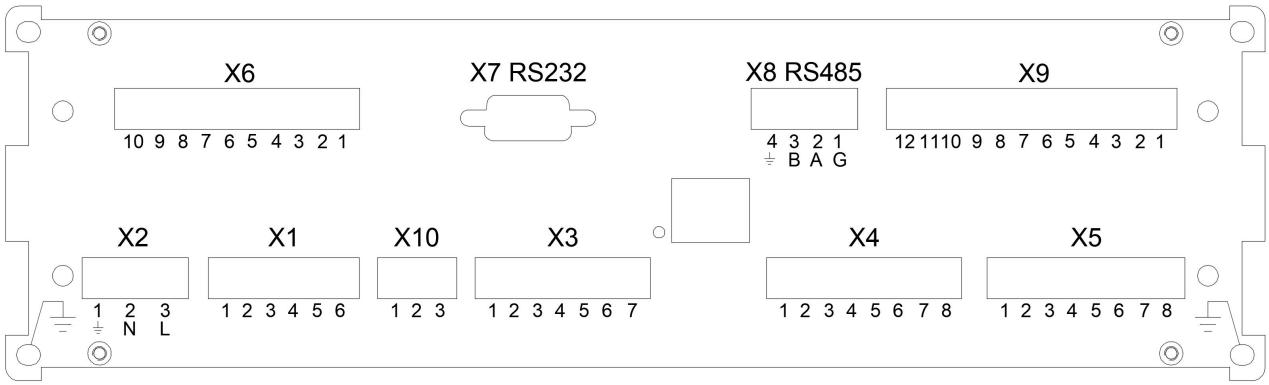
0 ~ 9 Enter parameters

− · Enter sign and decimal point

2.4 Diagram Of Back Panel



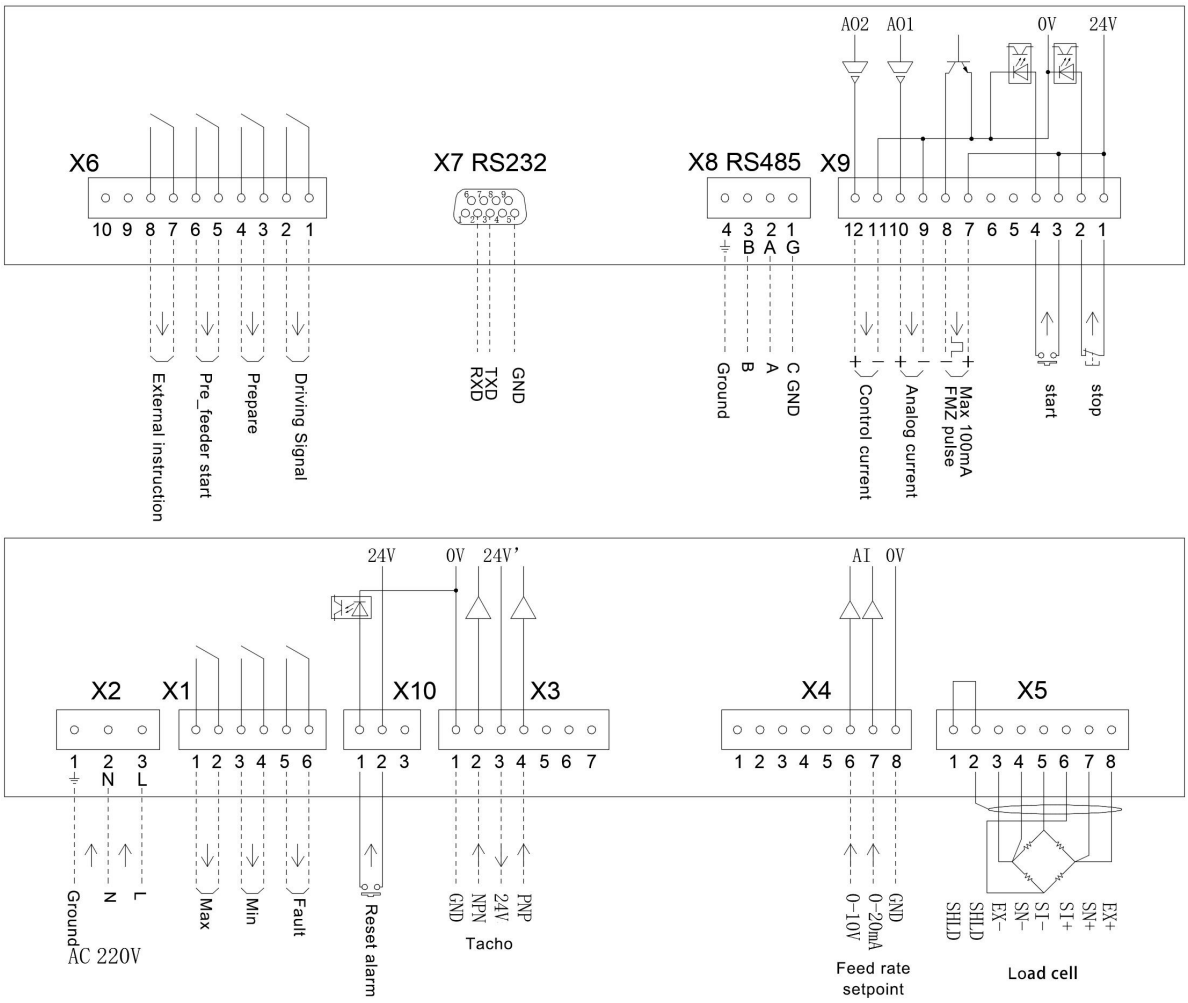
General type



Ethernet type

3. Introduction of Product

3.1 Defination of port



Note:The ports not marked in the figure (X3:5-7, X4:1-5, X6:9-10, X9:5-6, X10:3) are all reserved pin, please do not use them.

Port Definition

X1:

Terminal	FUNCTION	Interface standard
1,2	Max signal output: valid when closed	Passive Touch
3,4	Min Signal Output: valid when closed	Passive Touch
5,6	Fault-free Signal Output: valid when switching off	Passive Touch

X2:

Terminal	FUNCTION	Interface standard
1	Power grounding	
2	Power Neutral (N)	AC 220V
3	Power Line (L)	AC 220V

X3

Terminal	FUNCTION	Interface standard
1	GND of speed pulse	

2	NPN Tacho Input	
3	24V output	DC 24V
4	PNP Tacho Input	

X4

Terminal	FUNCTION	Interface standard
6	Analog input 0-10V of feed rate	0-10V
7	Analog input 0-20mA of feed rate	0-20mA
8	GND of analog	

X5

Terminal	FUNCTION	Interface standard
1,2	Shield wire of load cell	
3	Load cell EX-	DC 10V [-]
4	Load cell SN-	
5	Load cell SI-	
6	Load cell SI+	
7	Load cell SN+	
8	Load cell EX+	DC 10V [+]

X6:

Terminal	FUNCTION	Interface standard
1,2	Driving signal output: valid when closed	Passive Touch
3,4	Prepared signal output: valid when closed	Passive Touch
5,6	Pre-feeding start output: valid when closed	Passive Touch
7,8	External instruction: valid when closed	Passive Touch
9,10	Reserved	Passive Touch

X7:

Terminal	FUNCTION	Interface standard
2	TXD	RS232
3	RXD	RS232
5	Communication Ground	

X8:

Terminal	FUNCTION	Interface standard
1	Communication Ground	
2	A Terminal	RS485
3	B Terminal	RS485
4	Ground	

X9:

Terminal	FUNCTION	Interface standard
1,2	External control signal to stop: valid when	

	disconnect	
3,4	External control signal to start: valid when closed	
5,6	Reserved	
7,8	FMZ pulse output	MAX 100mA (DC 24V)
9 10	Analog current output (A01) [-] Analog current output (A01) [+] E01: Flow, load, speed output (optional)	4-20mA
11 12	Control signal of Feeder rate output (A02) [-] Control signal of Feeder rate output (A02) [+]	4-20mA

X10

Terminal	FUNCTION	Interface standard
1,2	Reset Alarm: valid when closed	

3.2 Main Interface Display

When powered on, the main interface displays as shown in the following figure

Two lines of mark area at left. Upper is “system info”, lower is “events info”.
Two lines of mark area at right. Upper is "set flow", "real time flow", "time", lower is "real-time parameters”.

1) Upper right (select by ▪ key)

P	Set feed rate	t/h or kg/h
I	Real time feed rate	t/h or kg/h
12:20:30	Time	

2) Bottom right (select by ▲ ▼ key)

Z_0	Totalizing counter	kg or t
Z_1 Z_2 Z_3	Class accumulate counter	kg or t
Zb	Batch setpoint	kg or t
Zi	Batch actual value	kg or t
Zd	Batch left value	kg or t

(Note: Zb, Zi, Zd won’t display unless the Batch is set.)
Zd=Zb-Zi

I	Feed rate Material amount discharged from conveyor belt per unit time	kg/h or t/h
Ir	Feed rate/Nominal Feed rate, feed rate relative	%

Pe	External analog signal setpoint by DCS interface	t/h or kg/h
Pr	External setpoint for modification percentage, relative setpoint	%
Q	Belt load. Weight of material on one belt meter	kg/m
Qr	Percentage for belt load. Belt load/nominal belt load	%
V	Belt speed	m/s
Xd	Deviation of feed rate	%
Xr	Percentage of control output	%

3) System info.(upper left of the display)

System info area have 4 positions, from left to right are pos1, pos 2, pos 3, pos 4.

pos1

R Run mark. Flash when speed pulse is detected.

pos 2

M Weighing mode

V Volume mode

V flash The system is running in a start interval or stop interval status

pos 3

F Batch overflow, this batch reaches set value Zb.

K Keyboard start/stop mode

S Serial start/stop mode

E Port start/stop mode

pos 4

K Set the feed rate by key

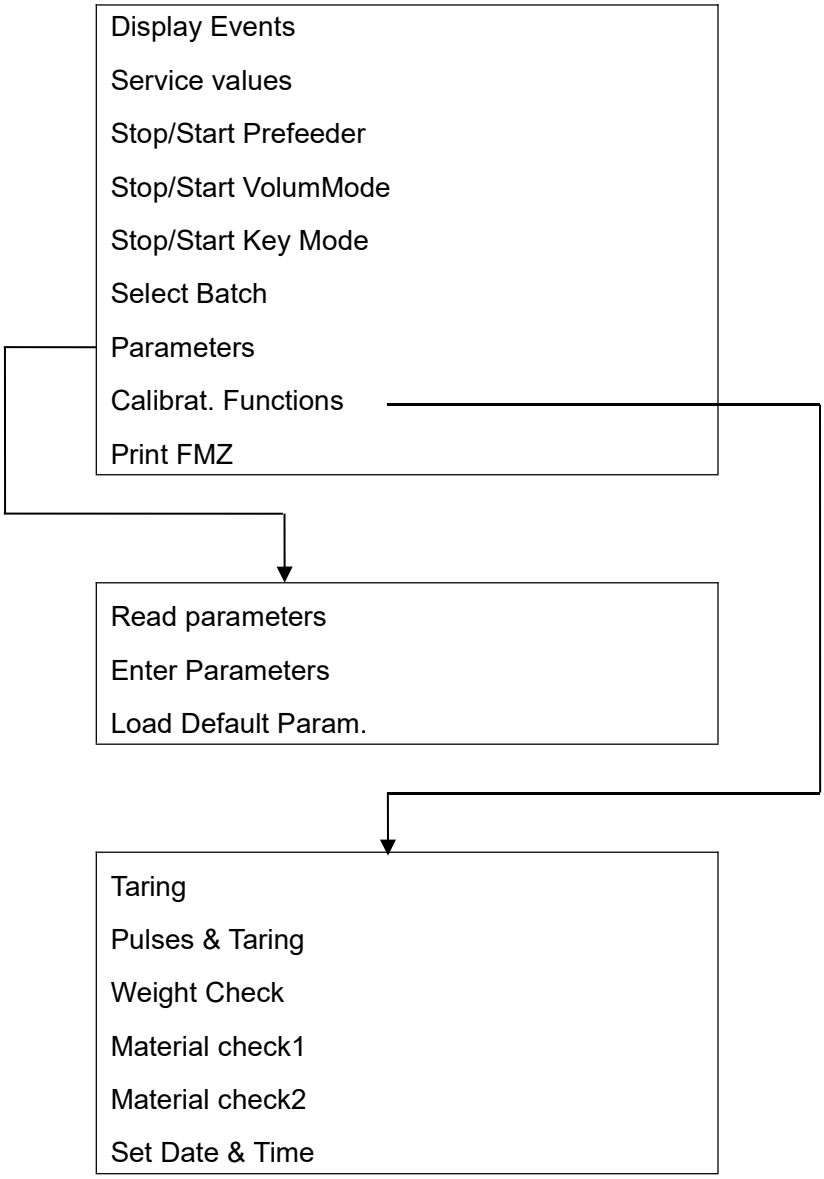
S Set the feed rate by serial

A Set the feed rate by inputting the analog value of current or voltage.

4) Event info.(Bottom left of the display)

S1 Event information, see Chapter 8 for the meaning and explanation of each letter.

3.3 Menu items



Function and operation of the system menu:

Display Events

1) Stop/Start Prefeeder

Function: When a pre-feeder is required, the pre-feeder should be activated. Then when the system starts, the pre-feeder and belt motor will start together; and when the system stops, the pre-feeder and belt motor will stop together. However, if the Interval mode is activated (when the relevant parameter R14 is not zero), the pre-feeder will immediately stop, and the belt motor will only stop after completing the interval distance.

Operation: See Chapter 3.5

2) Service values

Function: See Chapter 7

Operation: See Chapter 3.5

3) Stop/Start Volum Mode

Function:The instrument controls the belt motor to run at a constant speed. In this mode, the speed of the feeder depends on the set feed rate and is direct proportional to it. At this point, the PID stops working.

Operation: See Chapter 3.5

Mark: “V”

4) Stop/Start Key Mode

Function: You can set the feed rate and start/ stop the feeder by activating the keyboard mode in the main menu, allowing to be temporarily controlled by the keyboard. This is very useful during on-site debugging; Stop keyboard mode, means Control the start/stop and flow setting of the feeder through external means.

Operation: see Chapter 3.5 for details

Mark : 'K'

5) Select Batch

Function: After enabling this function, batch batching can be carried out according to the set batch size. The main display will add parameter displays for Zb, Zi, and Zd, as well as batch count information (meaning as shown in Chapter 3.2) at the bottom left of the screen. When the batch size is completed, the system will temporarily stop running and there will be an "F" to print the batch size of this batch; If you want to start another batch, just press "  " to confirm the event before starting the operation.

Operation: see Chapter 3.5 for details on setting batch targets (Zb)

Mark: "F" flashing

6) Parameters

Function: All operation parameters for reading, modifying, reinstalling the system.

Operation: see Chapter 3.5.

7) Calibrat. Functions

Function: see Chapter 4.3

Operation: see Chapter 4.3.

8) Print FMZ

Function: If configure printer, Z0, Z1, Z2, Z3 result can be printed.

9) Start interval /stop interval

Start interval

Function: When R13≠0 and the system switchs on, the pre-feeder and belt motor start together. Then the system is running in volume mode, and the PID does not work. The speed will follow the last running speed (the flow speed when the PID reaches a constant). When the number of belt turns in R13 is reached, the PID starts to activate, and the main screen flashes from "V" to "M", which is the weight mode. It effectively overcomes the condition that the pre-feeder loses control due to zero load during system startup.

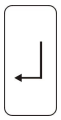
Stop interval

Function:When R14≠0, the pre-feeder will immediately stop if the system stops, and "V" flashes in the main display. The material on the belt will be discharged after the number of belt turns in R14, and the counter will work. The belt motor will only stop after the material is discharged.

3.4 Call System Menu

Call System Menu

Select **“System”** menu



Confirm the selected item

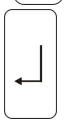
Return to Previous Menu

3.5 Call Parameter Menu

3.5.1 Operation of reading parameter

Call system Menu

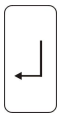
Select **“Parameters”** menu



Select **“Parameters”** menu

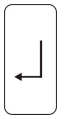
Confirm

Select parameters sub-menu



Confirm

Select parameter block



Confirm

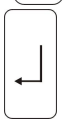
Read the parameter in the block

Return to Previous Menu

3.5.2 Operation of modifying parameter

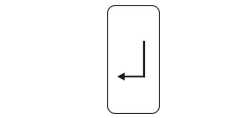
Call system Menu

Select **“Parameters”** menu

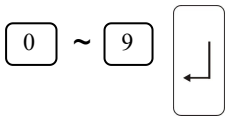


Confirm

Select **“Enter Parameters”** sub-menu

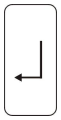


Confirm



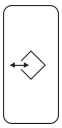
Enter the password 3.14159 and confirm

Select parameter block



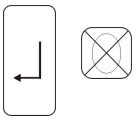
Confirm

Select parameter No.



Activate Cursor

Specify options or enter numerical values (numeric keys)



Confirm input or delete and re-enter the value

Return to Previous Menu

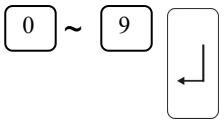
3.5.3 Loading default values

Call system Menu

Select **“Parameters”** menu

Confirm

Select the sub-menu of loading default value



Enter the password 3.14159 and confirm

Note: After loading the default values, all parameters will be restored to the factory settings.

4. Usage and Operation

All parameters of the instrument have been set to default values at the factory, and the control current output, flow current output, external control current or voltage input have been adjusted; Please refer to this chapter carefully before use, so that you can better use this instrument.
Before the controller and scale body of the weighing mechanical (such as quantitative feeder, electronic belt scale, etc.) are formed into a system, they must carry out the current Calibration (refer to the appendix) in order to control the operating speed of the belt motor and display the feeding flow correctly. After the instrument is installed on the system, a system Calibration is also required (refer to section 4.3).

4.1 Basic operation of the Instrument

● Connect the instrument power supply, and the two green lights on the upper left of the instrument panel will be on, indicating that the power supply is normal and the instrument is ready for operation.
● Press the Start key  on the panel, and when the instrument is in operation, the system information area on the screen displays an "R" sign, indicating that the instrument has entered normal operation.
● **Setting of given feed rate**: The setting of given feed rate can be achieved through instrument keyboard input, external analog input, and communication input methods; There are three options to choose from in B07 parameters: **Key** (**keyboard), Com. (communication), and AI (analog).**
a) Keyboard input method: When B07 parameter selects Key mode, continuously press the DAT key  twice on the main interface, and the window will display "P= t/h" in the lower line. After input the required value, press the ENT key  to confirm the input value; If you need to delete a certain number, press the DEL key  ; If the input is terminated, press the ESC key  .

b) **Communication input method:** When the instrument and upper computer form a control system, the flow is set through a serial port.
c) **External analog input method**: When B07 parameter selects AI, the set value of flow is determined by the current or voltage input of the external analog signal.

● **Clear accumulated value:** Press the Reset key  to enter the prompt interface, then press the Up/Down key  to select the counters (Z_0, Z_1, Z_2, Z_3) that need to clear the accumulated value, and press the ENT key  to clear; Press the ESC key  to cancel the clear operation.

● Check event information: Follow the operation in Chapter 3.5 to run the display of event sub-menu. If there is any information, it will be displayed one by one (see Chapter 8 for relevant settings and content).
● Confirm event information: Press the DEL key  , and the instrument will clear the displayed event codes that have been resolved based on the event situation. If the event or fault still exist, the event codes cannot be cleared (see Chapter 8 for details).

4.2 Important Tips for Use

1) After the table is installed on the system, a system Calibration must be performed first.
Before calibration, the parameters of Block B and Block C (B02 and Block C) should be set according to the actual situation.
For example, the Rated Feed Rate is 100t/h (parameter B02), the Belt Circuit Num. is 1 (parameter C02), the Belt Circuit Time (the time for 1 circuit of the belt cycle) is 30S (use a stopwatch to check the belt time for 1 circuit, parameter C03), the Belt len (belt length) is 10m (actual belt length, parameter C04), the L/C Charc. Value (sensitivity of the sensor) is 2mv/v (see sensor label, parameter C05), and L/C Rated Cap. (the total range of the sensor) is 60kg (see sensor label, parameter C06). The Eff. Platf. Length (effective platform length) is 1m, (See the effective length of the actual scale body, parameter C07), with a Lever Ratio of 1 (parameter C08), an Angle a (scale installation angle) of 0 (parameter C09), and a Check Weight of 10kg (actual weight, used during weight calibration, parameter C10). Input the above parameters into the corresponding parameters of the instrument.
2) After the calibration is completed, enter the weight mode, and the screen will display "M" in the system information area. Press the key [|] to start. If there is no speed pulse signal input, the Mark "R" will not flash.
3) PID regulating, R02 (P_Component) and R03 (I-Component) default values are 0.2. When the material feeding is very uneven, R02 and R03 can be reduced to avoid excessive regulating fluctuations.
4) When a stable control output current value is required and PID regulation is not required, volume mode can be activated. At this time, the control output current value is:

Icontrol=(P/B02) * (R10-R09)+R09

P: Set Feed Rate value B02: Rated Feed Rate

R09: Ctrl AO Lower Limit R10: Ctrl AO Upper limit

When turning off PID control in volume mode, the "V" symbol will be displayed in the system information area of the main interface.
5) If the external control input is voltage and connected to X4 (6, 8), the effect of 0V is related to the current input 0mA, and the effect of 10V is related to the current input 20mA. At this time, modify the values of R15 and R16 to meet the actual requirement.
6) In the External given mode, the sign is "E".
7) The weight represented by each cumulative pulse output of X9 (7, 8) depends on the set value of B12.

4.3 System Calibration and Calibration

A weighing and feeding system which is formed by the instrument, belt scale, speed adjustment controllers, etc. must be verified and calibrated before it can be put into normal used. Calibration and calibration should be carried out by calling the "calibration calibration" function of the instrument, and the initial Calibration should be carried out in the order of "tare calibration", "cumulative calibration", or "material calibration".

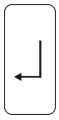
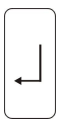
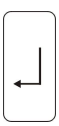
4.3.1 Calibration conditions

1) Input the parameter values of Block B (Rated Data) one by one according to the requirements of the system and instruments, and input the parameter values of Block C

(Calibrating Data) one by one according to the relevant technical parameters and installation data of the scale body. Among them, the C03 Belt Circuit Time parameter should be accurately measured for one circuit of belt running at rated speed, and input with measured values.
2) The control output ratio during Calibration defaults to the C11 parameter set value (100%). When C11 is set to 0 or calibrated in volume mode,
the control output ratio= set value of feed rate P/Nominal Feed Rate B02.
3) During initial Calibration or simultaneous periodic pulse calibration, the control output parameter for C11 Calibration should be 100%, or the flow set value P for Calibration in volume mode should be the Nominal Feed Rate, and the D02 Span Correction parameter should be 1.
4) Initial calibration, or adjusting and replacing the speed sensor (device), or changing the parameters of C03 and C04, should carry out the belt periodic pulse calibration.
5) Re-calibration should be carried out if adjusting and replacing the belt, changing the parameters of B04 and B05, or changing the parameters of Block C.
6) The belt scale runs with no load and ensures that the belt is unloaded, and the normal sticking material generated during operation may not be removed.

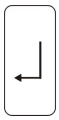
4.3.2 Tare weight Calibration and periodic pulse calibration

1) Calibration purpose: Tare weight Calibration can obtain the basic self weight of the belt scale, and there is no limit on the measurement value for tare weight calibration. Periodic pulse Calibration can obtain the number of pulses for a belt circuit, determine the circuit time during running for test, and automatically calculate the characteristic value B04 for speed measurement and the rated speed B05 for the belt.
2) Tare weight Calibration can be carried out separately or together with periodic pulse calibration, but periodic pulse Calibration should be carried out first during the first calibration.
3) Action:

	Call up the system menu
	Select the "Calibrat. Function"
	Confirm and display “Enter Password”
	Input the password “3.14159”
	Confirm
	Select "1>Taring" or "2>Pulses & Taring calibration".
	Confirm and enter the Calibration program.

Follow the screen prompts, press  to let the belt run at the set speed. If the belt (feeder)

has not been started yet, follow the prompts to start the operation. After the belt runs stably, press the button [2] to start calibration.
After the calibration is completed and the circuit pulse is to be verified, the average speed of the belt and the speed measurement characteristics will be displayed first. Press the confirm button to enter the next item. When the circuit pulse is not verified, the tare Calibration result is displayed directly. At this point, the upper part of the display screen displays the cumulative value of the tare calibration process (in the same unit as Z_0), and the lower part displays the percentage of the basic self weight to the rated load.



Accept the Calibration results, and the instrument automatically updates the parameter values of D03, D04, and D05,
When performing periodic pulse Calibration at the same time, the parameter values of B04, B05, and D06 will also be updated.

Give up. Press this key during the Calibration process to interrupt the operation and return

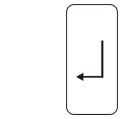
Note: 1) The constant speed running of the belt does not require measuring the belt speed. When the B03 parameter is "not measuring the speed", the initial calibration should also carry out the periodic pulse calibration first, and the instrument will generate belt periodic pulses internally.
2) Although there is no limit value set for tare weight calibration, if the percentage is too large or the cumulative value of the second and subsequent measurements is too large, the belt scale carrier should be checked.
3) Subsequent operations may not follow the order specified in the initial calibration, but can be performed separately for tare weight calibration; When only performing tare calibration, the output ratio or flow setting value P (C11=0 or calibration in volume mode) can also be set to the current working value during C11 calibration.
4)·When checking the tare weight, there must be no load on the belt.

4.3.3 Weight Check

1) Calibration purpose: To test and calibrate the belt scale system by simulating material load, and to confirm whether its weighing accuracy meets the requirements of belt scale .
2) Before starting the calibration, according to the requirements of the belt scale body, place a calibrator with certain weight (analog calibrator, calibration rod, calibration weight, etc.) at a fixed position on the carrier, and confirm or convert the weight value (effective simulated load) carried on the effective weighing platform, and input the C10 parameter.
3) Action:

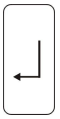
Call up the system menu

Select the "Calibrat. Function"

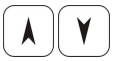


Confirm and display “Enter Password”

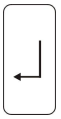
Input the password “3.14159”



Confirm



Select "3>Weight Check".



Confirm and enter the Calibration program.

Follow the screen prompts to operate. If the speed is not selected in advance, press the Number key [1] to run the belt at the set speed. If the belt (feeder) has not been started yet, press the prompts to start running. After the belt runs stably, press the Number key [2] to start calibration.

After the calibration is completed, the upper part of the display screen displays the cumulative weighing value during the operating time, and the lower part displays the ratio of the theoretical calculated value to the measured value, represented by K0R.

- The K0R is between 0.99 and 1.01: the weighing is accurate and meets the requirements.
- K0R is between 0.95 and 1.05: press [↵] key to automatically store the K0R value as the D02 parameter value as a new correction factor.
- If K0R<0.95 or K0R>1.05: the deviation is too large, there may be inaccurate input of certain parameter data in Block C (such as Lever Ratio, Angle a) or mechanical failure of the belt scale (such as straightness, material jamming, serious belt deviation, etc.). After inspection, recheck.

Note: 1) It should be ensured that the simulated weight value of C10 Check Weight (Rated load × Effective platform length) is between 30% and 100% of the rated total load value specified by the belt scale.

2) For subsequent operation, independent selection and operation can be carried out without following the sequence specified in the initial calibration. The D02 parameter maintains the verified value, and during C11 Y-Out During Calib., the output ratio flow setting value P (C11=0 or calibration in volume mode) can also be set to the operating value at that time.

4.3.4 Material Check 1

Material Check 1 refers to the cumulative weighing Calibration with actual transported materials. The belt scale system can be put into normal operation after carried out "Taring" and "Weight Check". In order to make the calibration more suit for the actual situation on site and obtain high-precision weighing results, Material Check can also be selected. In subsequent use, Material Check can also be carried out to ensure the weighing accuracy of the belt scale system.

1) Calibration conditions:
a. The initial Calibration or re-Calibration operation has been completed.
b. The actual materials used for calibration should be accurately weighed, and the accuracy of the weighing scale should be at least one level higher than the measurement accuracy of the belt scale.
2) Action:
a. Maintain the parameters calibrated by D02 and start the belt scale system for feeding. It is recommended to run at normal speed.
b. After entering the interface of Material Check 1, follow the screen prompts. If the speed is not selected in advance, press "0" to automatically control the speed, or press "1" to set the speed. After the running is stable, press "2" to start Calibration and transport a certain weight of material on the belt. After the material passes through the belt, press "3" to immediately end, or press "5" to wait for the belt to complete one full circuit before ending.
c. Follow the prompts to input the actual weight of the material, and the instrument will automatically calculate the calibration coefficient.

4.3.5 Material Check 2

1) Calibration conditions:
a. The initial Calibration or re-Calibration operation has been completed.
b. The actual materials used for calibration should be accurately weighed, and the accuracy of the weighing scale should be at least one level higher than the measurement accuracy of the belt scale.
c. The total weight of materials used for calibration shall not be less than 2% of the maximum conveying capacity of the belt scale feeder in one hour.
2) Action:
a. Start the belt scale system for feeding, zero or record the current cumulative value, then let the material with known weight passes through the belt, or accurately weigh the material which passed through the belt just now. Record the increased cumulative value when all materials pass through the belt.
b. After entering the Material Check 2 interface, follow the screen prompts. First, input the actual weight of the material and confirm.
C. Then follow the prompts to input the increased cumulative value measured by the instrument, and the instrument will automatically calculate the calibration coefficient.

4.3.6 Linearization correction

Generally speaking, belt loads do not require linearization.
Linearization only has good significance when using harder belt load changes and simple mechanical weighing systems.
Use calibration weight correction:
1. Apply the calibration weight Q1, start the weighing device, and call the zero calibration program.
2. Record the results of the zero calibration program (data deviating from the rated load), interrupt the program and do not rewrite the results (then input them into parameter Lin-I1).

3. Enter the parameter Lin-S1.

$$\text{Lin-S}_1 = \frac{Q1}{L} \cdot \frac{100\%}{q0}$$

Q1=Calibration weight, expressed in Kg

L=effective platform length (parameter C06), expressed in m

Q0=Nominal Belt Road (parameter D01), expressed in kg/m

4. For the remaining nonlinear points where gradually increase the calibrated weight, repeat steps 1... 3.

Note: linearization calibration should start from the first point, and if there are points that are not calibrated later, it should be set as a percentage greater than the first point, usually 1000%.

Use material inspection and correction:

1. Carry out the material testing with belt load q1.
2. Read the average value of belt load q1 (a) from the instrument and input the value into Lin-I1.
3. Input the parameter Lin-S1.

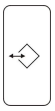
$$\text{Lin-S}_1 = q1(a)\frac{Ms}{Ma}$$

Ms=amount of material fed, expressed in Kg

Ma=the amount of material read from the instrument, expressed in kg

4. For the remaining nonlinear points where gradually increase the calibrated weight, repeat steps 1... 3. The parameters must be from low to high, otherwise an error message S6 will appear.

4.3.7 Set time and date

Set Date & Time interface to display the current real-time date and time. Press the set key  to activate the cursor, and then press the set key again to switch to the position to be modified. When the cursor flashes, press the number keys or up and down keys to modify the value.

5. Parameters

5.1 A>Language

BLOCK A	Rated Data	Range	Default
A01	Langure_unit	Chinese, English	Chinese
	Select instrumentation language display. Only Chinese & English version		

5.2 B>Rated data

BLOCK B	Rated Data	Range	Default
B01	Feed Rate Unit	Kg/h, t/h	t/h
B01.1	Feed Rate Dot	0~3	**.**
	The selection of B01 and B01.1 determines the units and decimal positions of the set feed rate P and real-time feed rate I in the main interface		
B02	Nominal Feed Rate	0.002t/h-99999.999t/h	10.000t/h
B03	Tacho Active	Yes/No	Yes
	If select no, instrument will use B05 parameter in weighing calculation		
B04	vs Charact. val.	10~100000l/m	10000.00 l/m
B05	Nominal Speed	0.01 ~ 10 m/s	0.1000m/s
B06	TART Source	Key., Com., DI	Key.
B07	P - Source	Key. , Com., AI	Key.
B08	Prel Ext. Active	No, Yes	Yes
	When B07 select ext.(serial, analog), the parameter decide whether to modify flow set value percentage or not.		
B09	WZ Active	No, Yes	Yes
	If select YES, read load cell signal; select No, analog weight C10 as weighing signal.		
B10	Zo Unit	Kg, t, 10t, 100t	t
B10.1	Z0 Dot	0~3	**.**
	When the cumulative unit is set to 10t or 100t, it can only be set to 0 decimal places.		
B11	Z0 Pulse Time	0~1000ms	50.00ms
	Output ext. total accumulation pulse width, A weighing value pulse determined by B12. B11 and B12 shall be selected to ensure frequency of output pulse is less than 10Hz.		
B12	Z0 Pulse weight	0~1000000kg	1000.00kg
	When the cumulative weight reaches one pulse, a cumulative pulse signal is issued		
B13	Z1 Unit	Kg, t, 10t, 100t	t
B13.1	Z1 Dot	0~3	**.**
	Select units and decimal points for Z1 in the main interface; When the cumulative unit is set to 10t or 100t, it can only be set to 0 decimal places.		

B14	**Z1 End Time (h. m. s)**	**0~240000**	**080000**
	Last time Z1 count, start time is last time Z3 (B18).		
B15	**Z2 Unit**	**Kg, t, 10t, 100t**	**t**
B15.1	**Z2 Dot**	**0~3**	****.****
	Select units and decimal points for Z2 in the main interface; When the cumulative unit is set to 10t or 100t, it can only be set to 0 decimal places.		
B16	**Z2 End Time (h. m. s)**	**0~240000**	**160000**
	Last time Z2 count, start time is last time Z1 (B12).		
B17	**Z3 Unit**	**Kg, t, 10t, 100t**	**t**
B17.1	**Z3 Dot**	**0~3**	****.****
	Select units and decimal points for Z31 in the main interface; When the cumulative unit is set to 10t or 100t, it can only be set to 0 decimal places.		
B18	**Z3 End Time (h. m. s)**	**0~240000**	**240000)**
	Last time Z3 count, start time is last time Z2 (B14).		

5.3 C> Calibrating Data

BLOCK C will determine results of BLOCK D. Should be according to the specifications and configuration of the scale body, and be measured on-site to ensure the data accurate.
which should to ensure accurate data.

BLOCK C	Enter Parameters	Range	Default
C02	**Belt Circuit Num**	**1-100**	**1.00**
	The number of circuit (turns) of belt operation to be determined during system calibration.		
C03	**Belt Circuit Time**	**10-9999.0 s**	**30s**
	The belt runs at full speed for one circuit. The C02 and C03 parameters determine the total time for system calibration.		
C04	**Belt Circuit Len**	**1-9999m**	**30.000m**
C05	**L/C Charac. Value**	**0.5~10mV/V**	**2.0000mv/V**
C06	**L/C Rated Cap.**	**0.5~20000Kg**	**50.00Kg**
	If belt scale is configured with more than 1 load cell, input total rated load.		
C07	**Eff. Platf. Length**	**0.10~50m**	**0.50m**
	The distance between the two imaginary lines on the 1/2 distance between the two ends of the weighing roller of the belt scale carrier and the closest conveying roller When there is only one weighing roller, the weighing length is equal to 1/2 of the distance between the two closest conveying roller on both sides of the weighing roller.		
C08	**Lever Ratio**	**0.0100~2.0000**	**1.0000**
	C08=LWZ / LPG, LWZ: length between load sensor to leverage anchor; LPG: length between force center of load roller to leverage anchor. The lever ratio of the suspended belt scale with direct weighing structure is 1.		
C09	**Angle a**	**0~15°(degree)**	**0.00°**

Only applicable when there is an angle between the force direction of the weighing sensor and the direction of the plumb

C10	**Check Weight**	**1~20000kg**	**10.000Kg**
	Convert weight checker to effective analog weight on the effective weighing platform When loading a calibrator (such as a weight), it is converted into the effective weight loaded onto the sensor. When the **Lever Ratio** is not 1 or the **Angle a** is not 0, it will not equal the weight of the weight.		
C11	**Y-out During Calib.**	**0~100%**	**100%**
	When the C11 is set to 0, the control output ratio during Calibration is equal to the set target feed rate/rated feed rate.		

5.4 D> Calibrat. Results

The results of system calibration, generally do not need to be modified, and incorrect settings will affect the weighing accuracy.

BLOCK D	**Cal.Result**	**Range**	**Default**
D01	**Nominal Belt Load**	**D01=B02/(B05×3.6)** **B02 (Nominal Feed Rate):t/h** **B05 (Nominal Speed): m/s,** **D01:kg/m**	**27.78Kg/m**
	No input possible.		
D02	**Span Correction**	**0.001~99999**	**1.0000**
	Ensure the accuracy of the weighing value, automatically written in after the results of cumulative Calibration or physical Calibration are confirmed, and can also be manually modified..		
D03	**Total Tare**	**No input possible**	
	D03=D04+D05		
D04	**Basic Tare**	**No input possible**	
	Belt self weight. The results of tare weight calibration. Should not be modified unless necessary. Include the weight of the carrier, weighing rollers, and belts inside the weighing platform.		
D05	**Tare Correction**	**No input possible**	
	The deviation value of the belt. Automatic writing tare weight after zero point tracking and starting the Tare measurement calculation.		
D06	**Belt Cyc.velum**	**No input possible**	
	Result of "Belt periodic pulse" program running.		

5.5 E>Analog Output

Block E is the Analog Output parameter.

BLOCK E	**Analog Output**	**Range/optional**	**Default**
E01	**Analog Output Sel (AA)**	**I, Q, V**	**I**
	Select the definition of X9 (9-10) analog output current		

E02	**Analog Output Min (AA)**	**0-24 mA**	**4.0 mA**
	Determine the lower limit value of X9 (9-10) output current		
E03	**Analog Output Max (AA)**	**0-20 mA**	**20.0mA**
	Determine the upper limit value of X9 (9-10) output current.		

5.6 F>Limit Values

BLOCK F If the measure exceeds minimum / maximum value, display events information code.

BLOCK F	**Limit Values**	**Range**	**Default**
F01	**Limit Value MIN**	**Imin, Qmin, Vmin**	**Imin**
	Determine minimum event info definition, correspond to minimum alarm lamp and minimum output terminal.		
F02	**Limit Value MAX**	**Imax, Qmax, Vmax**	**Imax**
	Determine maximum event info definition, correspond to maximum alarm lamp and maximum output terminal.		
F03	**Value for I-MIN**	**-10%~20%I**	**5%I**
	Determine flow lower limit threshold, expressed as a percentage of the rated feed rate (B02 parameter)		
F04	**Event Class I-MIN**	**Igno, W1, W2, ALM**	**W2 (code L1)**
F05	**Value for I-MAX**	**100%~200%I**	**120%I**
	Determine flow upper limit threshold, expressed as a percentage of the rated feed rate (B02 parameter).		
F06	**Event Class I-MAX**	**Igno, W1, W2, ALM**	**W2 (code H1)**
F07	**Value for Q-MIN**	**-10%~200%Q**	**5%Q**
	Determine load lower limit threshold, expressed as a percentage of the rated load (Parameter D01).		
F08	**Event Clas.Q-MIN**	**Igno, W1, W2, ALM**	**W2 (code L2)**
F09	**Value for Q-MAX**	**100%~200%Q**	**120%Q**
	Determine load upper limit threshold, expressed as a percentage of the rated load (Parameter D01).		
F10	**Event Classs Q-MAX**	**Igno, W1, W2, ALM**	**W2 (code H2)**
F11	**Value for V-MIN**	**-10~20.0%V**	**5%V**
	Determine speed lower limit threshold, expressed as a percentage of the rated speed (B05 parameter)		
F12	**Event Class V-MIN**	**Igno, W1, W2, ALM**	**W2 (code L3)**
F13	**Value for V-MAX**	**-10%~200%V**	**120%V**
	Determine speed upper limit threshold, expressed as a percentage of the rated speed (B05 parameter)		
F14	**Event Class V-MAX**	**Igno, W1, W2, ALM**	**W2 (code H3)**

5.7 E>Filter Setting

BLOCK G	**Filter Setting**	**Range**	**Default**
G01	**I Display**	**0.0~60.0s**	**3.0s**
	Only works for display		

G02	**I Analog Output**	**0.0~60.0s**	**3.0s**
	Output filter of Analog current X9 (9-10)		
G03	**I Communicate**	**0.0~60.0s**	**3.0s**
G04	**Q Display**	**0.0~60.0s**	**3.0s**
G05	**V Display**	**0.0~60.0s**	**3.0s**
	Only works for display		
G06	**L/C Filter**	**0~23**	**13**
	The weight filtering coefficient, affects the weighing and control accuracy.		
G07	**Stop Sum Delay**	**0.0~3600.0s**	**1.0s**
	The delay time for continuing to accumulate weight during system shutdown.		

5.8 K>Inside Run

BLOCK K	Inside Run	Range	Default
K01	**Maintenance Elec**	**1~10000h**	**3000h**
K02	**Event Maint. EL.**	**Igno, W1, W2, ALM**	**Igno (code S4)**
K03	**Maint.Run time**	**1~10000h**	**3000h**
K04	**Event Maint.Run**	**Igno, W1, W2, ALM**	**Igno (code S3)**

5.9 Q> Events

BLOCK Q	Event	Range	Default
Q03	**Tacho Input > MAX**	**Igno, W1, W2, ALM**	**W2 (code C2)**
Q05	**Tacho Error**	**Igno, W1, W2, ALM**	**W2 (code E2)**
Q08	**Load Cell Error**	**Igno, W1, W2, ALM**	**ALM (code C1)**
Q09	**NO Release**	**Igno, W1, W2, ALM**	**W2 (code S2)**
Q10	**L/C Input>MAX**	**Igno, W1, W2, ALM**	**W1 (code H4)**
Q11	**L/C Input<MIN**	**Igno, W1, W2, ALM**	**W1 (code L4)**

5.10 R> Control

BLOCK R	Control	Range	Default
R02	**P-Component Kp**	**0.0000~2.0000**	**0.2000**
	The proportional control parameter of PID regulation, the larger the value, the faster the regulate; and excessive value can easily cause oscillation.		
R03	**I-Component TN**	**0.0~100.0**	**0.2**
R04	**Contr.Dev.Filter**	**0.0~600.0s**	**3.0s**
	Filter of flow deviation Xd.		
R05	**Contr.Dev.Time**	**0.0~600.0s**	**20.0s**
R06	**Max.Contr.Dev.**	**0.0~100%**	**5.0%**
	The deviation range of flow control, relative to the set feed rate as a percentage. During automatic control, if the absolute value of Xd exceeds R06 within the R05 time, the control deviation event H5 will be triggered.		
R07	**Contr.Deviation**	**Igno, W1, W2, ALM**	**W1 (code H5)**
	Relative parameters: R04, R05, R06.		

R08	**Controller Ltd**	**Igno, W1, W2, ALM**	**W1 (code H6)**
	When analog value reached R10, display event H6.		
R09	**Ctrl AO Lower Limit**	**0~24mA**	**4.00mA**
	Lower limit value of analog output for control current X9 (11-12)		
R10	**Ctrl AO Upper Limit**	**0~24mA**	**20.00mA**
	Upper limit value of analog output for control current X9 (11-12)		
R12	**Position at Stop**	**0mA, R09**	**R09**
	When the system stops, the output of control current X9 (11-12), determined by the lower limit of 0mA or R09.		
R13	**Start-up**	**0.00~2.00Uml**	**0.00Uml**
	When the instrument is started, it first operates in volume mode, and the control belt runs at the R13 set value before PID adjustment. Generally used for control systems with high hysteresis, so that it could quickly reach stable control values after startup.		
R14	**Clearance**	**0.00~2.00Uml**	**0.00Uml**
	It is generally used to control the feeding of the pre-feeder. When the machine is stopped, the pre-feeder first stops running, and the system starts cleaning in volume mode. The system only stops running after the belt runs at the R14 set value, ensuring that the belt scale is unloaded..		
R15	**Analog In Lower**	**0-24.00mA**	**4.00mA**
	The lower limit value of the analog input for the external given current X4 (7-8). The R15 setpoint corresponds to the zero flow setpoint.		
R16	**Analog In Upper**	**0~24.00mA**	**20.00mA**
	The upper limit value of the analog input for the external given current X4 (7-8). The set value of R16 corresponds to the rated feed rate (B02). If the input is voltage, 10V corresponds to 20mA.		
R17	**AI Zero Range**	**0~8.00mA**	**5.60mA**
	When the external current input is lower than the zero zone set by R17, it is determined that the external set flow is 0.		
R21	**DO-Ready Func.**	**Ready Dev. BatEnd**	**Ready**
	Redefine the function of do-ready output port X6 (3-4)		
R22	**Sum During Calib.**	**No、Yes**	**Yes**
	If accumulate weight value or not during calibration		
R23	**Start Zero Mode**	**OFF, Circuit, Second**	**Off**
Off: No function of belt cleaning and skin measurement before starting; **Circuit**: The empty material duration and tare measurement duration are set according to the number of belt cycles, set to 1, and the instant length is the time that the belt runs for 1 circuit; **Second**: The empty material duration and tare measurement duration are set in seconds, set to 1, and the instant duration is 1 second.			
R24	**Start Clear Time**	**0-1200**	**0.00**
R25	**Start Zero time**	**0-1200**	**0.00**

5.11 L> Communication

BLOCK L	Communication	Range	Default

L01	**Address**	**1~247**	**1**
L02	**RS485 Baud Rate**	**4800,9600,19K2,38K4, 57600,115200**	**9600**
L03	**RS485 Data Format**	**8N1,8N2,8O1,8E1,7O1,7E1**	**8N1**
L04	**RS485 Protocol**	**ModbusRTU, Print**	**ModbusRTU**
L05	**RS232 Baud Rate**	**4800,9600,19K2,38K4, 57600,115200**	**9600**
L06	**RS232 Data Format**	**8N1,8N2,8O1,8E1,7O1,7E1**	**8N1**
L07	**RS232 Protocol**	**ModbusRTU, Print**	**Print**

5.12 P> Lineraization

BLOCK P	**Linearization**	**range**	**default**
P01	**Linearization ON**	**No, Yes**	**No**
	Use this function to linearize the belt loading measurement. Application see chapter 4.3.6.		
P02	**Lin-S1 (Actual)**	**0.01~1000.00%Q**	**20%Q**
	Reference: rated the belt loading (parameter D01). Linearization point 1: actual belt load weight, check weight or material measurement result. Q: The rated load of the belt (parameter D01). Expressed as a percentage of the rated load of the belt, the same below. Linearization point 1 actual value: actual belt load, such as calibrated weight or material measurement results.		
P03	**Lin-I1 (Measure)**	**0.01~1000.00%Q**	**20%Q**
	Linearization Point 1 Measured Value: The belt load measured by the instrument.		
P04	**Lin-S2 (Actual)**	**0.01~1000.00%Q**	**40%Q**
	Linearization point 2: see P02.		
P05	**Lin-I2 (Measure)**	**0.01~1000.00%Q**	**40%Q**
	Linearization point 2: see P03.		
P06	**Lin-S3 (Actual)**	**0.01~1000.00%Q**	**60%Q**
	Linearization point 3: see P02.		
P07	**Lin-I3 (Measure)**	**0.01~1000.00%Q**	**60%Q**
	Linearization point 3: see P03.		
P08	**Lin-S4 (Actual)**	**0.01~1000.00%Q**	**80%Q**
	Linearization point 4: see P02.		
P09	**Lin-I4 (Measure)**	**0.01~1000.00%Q**	**80%Q**
	Linearization point 4: see P03.		
P10	**Lin-S5 (Actual)**	**0.01~1000.00%Q**	**100%Q**
	Linearization point 5: see P02.		
P11	**Lin-I5 (Measure)**	**0.01~1000.00%Q**	**100%Q**
	Linearization point 5: see P03.		
P12	**Lineariz. Error**	**Igno, W1, W2, ALM**	**W2 (event code: S6)**

Only when linearization is enabled will the linearization parameters be judged.

5.13 H> Additional Device

BLOCK H	Additional Device	Range	Default
H01	ZDO Active	No, Yes	No
H02	ZDO limit	0.0~10.0%Q	1.0%Q
	Q: The rated load of the belt (parameter D01), expressed as a percentage of the rated load of the belt, the same below.		
H03	Zero Track Active	No, Yes	No
H04	Zero Track Mean	0.0~10.00%Q	1.0%Q
H05	Zero Track Max	0.0~100.0%Q	5.0%Q

5.14 J> Print

BLOCK H	Print	Range	Default
J01	Pirnt on Time 1	0~24h	24h
J02	Pirnt on Time 2	0~24h	24h
J03	Pirnt on Time 3	0~24h	24h
J04	Pirnt on Time 4	0~24h	24h
J05	Pirnt on Time 5	0~24h	24h

5.15 W> Ethernet

BLOCK H	Print	Range	Default
W01	IP 192.168.1.101	0.0.0.0~255.255.255.255	
	IP address		
W02	Subnet Mask 255.255.255.0	0.0.0.0~255.255.255.255	
W03	Gateway	0.0.0.0~255.255.255.255	192.168.1.1
	No need to set Gateway if cross network segment access is not required		

6. Communication Protocol

6.1 Communication Format

When the meter adopts MODBUS communication protocol, Calibration using CCITT-16 / N (G (x) = x16 + x15 + x13 +1).

Communication format:

1) **Read data:** address (device address) +03 H + xxH (register high address) + xxH (register low address) + xxH (register number high) + xxH (register number low) + CRCL(check low)+ CRCH (check high).
Device returns: address (device address) +03 H + xxH (number of bytes) + xxH (high byte) ++ xxH (low byte) + CRCL (check low) .+ CRCH (check high)
Ex.: The total cumulative is 10,000.84 , the integer part into long integer hexadecimal number : 00002710H, 0.84 fractional part is converted to floating point : 3F570A3DH, instrument address is 1, then read the instructions and return the following results:
Reading: 01H 03H 00H 14H 00H 04H 04H 0DH
Device return: 01H 03H 08H 00H 00H 27H 10H 3FH 57H 0AH 3DH 28H 76H

2) **Write data**:
① 10H features : address (device address) +10 H + xxH (register high address) + xxH (register low address) + xxH (register number high) + xxH (register number low) + xxH (total number of bytes) + xxH (high byte) + ... + xxH (low byte) + CRCL (check low)+ CRCH (check high) + CRCL (check low) .
If receiving correctly, device will return : address (device address) +10 H + xxH (register high address) + xxH (register low address) + xxH (register number high) + xxH (register number low) + CRCL (check low) + CRCH (check high).
As the length of the data is not the same, the transfer principle is: the higher bytes comes first, lower byte comes second
Such as: To set the flow as 100 (float type), we know the address for flow is 000CH, and 100 in 4 -byte characters is expressed as : 42C80000H, the transmission data is as follows :
01H 10H 00H 0CH 00H 02H 04H 42H C8H 00H 00H 66H 7CH
After the instrument receives the correct number, it will return the number from the top to the low register and verify it.
01H 10H 00H 0CH 00H 02H 81H CBH
When the setting range exceeds the limit or the address is not within the range, the reply will add 80H to the function byte 10H and include an error code.

② 06H features: only supports 2-byte write ,
Address (device address) +06 H + xxH (register high address) + xxH (register low address) + xxH (high byte) + xxH (low byte) + CRCL (check low) + CRCH (check high) .
If receiving correctly, device will return: address (device address) +06 H + xxH (register high address) + xxH (register low address) + xxH (high byte) + xxH (low byte) + CRCL (check low) +CRCH (check high).

6.2 Command Operation

6.2.1 Read-only Command

Address	Byte Count	Type	Description
31-32	4		Event Warn Message: Alarm H, Alarm M, Alarm L
33	2		System and relay message: SYS_status, JD_status
34-35	4	Long INT	Batch accumulate Counter Z1 (Integer part)
36-37	4	Float	Batch accumulate Counter Z1 (Fractional part)
38-39	4	Long INT	Batch accumulate Counter Z2 (Integer part)
40-41	4	Float	Batch accumulate Counter Z2 (Fractional part)
42-43	4	Long INT	Batch accumulate Counter Z3 (Integer part)
44-45	4	Float	Batch accumulate Counter Z3 (Fractional part)
46-47	4	Float	Batch finished amount
48-49	4	Float	Batch residual amount
50-51	4	Float	Current feed rate I
52-53	4	Float	Current Belt load
54-55	4	Float	Current Belt speed

Bit Address

bit	Value	Alarm_H			Alarm_M			Alarm_L			SYS_status		JD_status	
		Name	Func-tion	Code	Name	Func-tion	Code	Name	Func-tion	Code	Name	Func-tion	Name	Func-tion
7	0				Load cell	Normal		Feed Rate <I MIN	NO					
	1					Error	C1		YES	L1				
6	0	External STOP Key	Relea-sed		Speed Pulse	Normal		Belt Load	NO		Volumetric	Deactivate	External indicate relay	Non-output

	1		Non-Released	S2		Exceed	C2	< QMIN	YES	L2	Mode	Enable		Output
5	0	System run time	Normal		Feed Rate> IMAX	NO		Belt Speed <VMIN	NO		Speed Test?	NO	Pre-Feeder drive the Relay	Non-output
	1		Spill	S3		YES	H1		YES	L3		YES		output
4	0	Meter run time	Normal		Belt Load >QMAX	NO		Empty To Load cell	NO		Pre-feeder	Stop	Read /Error of Relay	Non-Output
	1		Spill	S4		YES	H2		YES	L4		Start		Output
3	0	Input password	Invalid		Belt Speed >VMAX	NO		Power	Normal			Stop	Belt Motor Drive The relay	Non-output
	1		valid	S5		YES	H3		Error	E1		Start		output
2	0	Linearization	Right		Over-Load for Load cell	NO		Speed Sensor	Normal		Batch To run	Stop	Relay For alarm	Non-Output
	1		Error	S6		YES	H4		Error	E2		Start		output
1	0	Analog signal Input	Invalid		Actual Feed Rate Out of tolerance	NO							Min for relay output	Non-Output
	1		Valid	S7		YES	H5							output
0	0				Output For Control Up to Limit value	NO							Max For Relay output	Non-output
	1					YES	H6							output

6.2.2 Read-Write Command

Address	Byte Count	Type	Description
0	2	INT	Speed mode: 1 external 0 analog
1-2	4	Float	Rated Feed Rate (Unit: Kg/h)
3	2	INT	Belt Cyc. Num.
4-5	4	Float	Belt Cyc. Time
6-7	4	Float	Belt length
8-9	4	Float	Rang of zero tracking
10	2	INT	Baud rate: 0:4800, 1:9600, 2:19200, 3:38400 4:57600, 5:115200
11	2	INT	Device address IDD
12-13	4	Float	Feed Rate Setpoint P
14-15	4	Float	Batch setpoint Zb
16-17	4	Float	P value setting of PID (0~2)
18-19	4	Float	I value setting of PID (0~100)
20-21	4	Long INT	Integer part of Totalizing counter Z0 (setting it to 0 means to clear totalizing counter, setting it to other data is invalid)
22-23	4	Float	Fractional part of Totalizing counter Z0
24	2	INT	Feeder: 1: start, 0: stop
25	2	INT	Pre-feeder: 1: start, 0: stop
26	2	INT	Volumetric Mode: 1: start, 0: stop
27	2	INT	Volumetric Synchronous Mode: 1: start 0: stop
28	2	INT	Batching Mode: 1: start 0: stop
29	2	INT	Batch completed symbol: 1: batch completed, 0: clear symbol
30	2	INT	Number of events, 0:clear events
56	2	INT	Start/stop mode 0: keyboard, 1: communication, 2: port
57-65			Reserved, Constant 0
66-67	4	Float	Batch advanced quantity (unit: Kg)
68-79			Reserved, Constant 0

6.2.3 Communication Calibration command

Address	Byte Count	Type	Description
80-81	4	Float	Load cell signal value (Unit: mV/V), read only
82-83	4	Float	Speed measurement signal frequency (Unit: Hz), read-only
84-85	4	Float	D04 Basic Tare Weight (Unit: Kg/m) The result of tare weight calibration, **NO NOT modify this parameter unless necessary!**
86-87	4	Float	D06 Belt Cycle Pulse Count (Unit: I/U), Read Only

			One of the results of periodic pulse calibration
88-89	4	Float	D02 Calibration coefficient Accumulated and physical Calibration results, **DO NOT modify this parameter unless necessary!**
90	2	INT	Communication Calibration mode, must be performed in Calibration mode except for physical Calibration 2. 1: Enter the calibration mode, the belt starts and runs at the speed ratio set in C11 (default 100%); 0: Exit Calibration mode and return to the original state.
91	2	INT	Communication Calibration command and status Write command: 0: Cancel calibration 100: Start tare calibration 200: Start periodic pulse and tare calibration 300: Start cumulative calibration 400: Start physical Calibration 1 430: Physical Calibration 1, complete immediately 450: Physical Calibration 1, completed after complete a whole circuit. 500: Start physical Calibration 2 Status: 0: Non Calibration status 4: Calibration failed 101: Tare Calibration completed 201: Periodic pulse and tare Calibration completed 301: Accumulated Calibration completed 401: Physical Calibration 1 cumulative end, waiting for actual weight to be written in 403: Physical Calibration 1 completed 501: Physical Calibration 2 has written the measured weight, waiting for the actual weight to be written 502: Physical Calibration 2 has written the actual weight, waiting for the measured weight to be written 503: Physical Calibration 2 completed
92	2	INT	Countdown time for communication Calibration (unit: S), read-only
93-94	4	Float	Communication physical Calibration 1 and physical Calibration 2, input the actual weight value of the material (unit: Kg)
95-96	4	Float	Read the accumulated weight value during communication tare calibration, cumulative calibration, and physical Calibration 1; When communicating with physical Calibration 2, input the weight value measured by this instrument. (Unit: Kg)

7. Service Parameter

The operation information of the weighing system during operation is recorded in the service value directory of the instrument in real-time. You can view it in real-time by selecting the Service Values item in the system menu. When viewing, it will not affect the operation of the system.

1) Load cell signal: X.XXXXX mV/V
2) Tacho input: X.XX Hz X.X %
3) Date and time: XXXX-XX-XX XX:XX:XX
4) DI state: DI ＝ XXX(1-On, 0-Off)
5) DO state: DO ＝ XXXXXXXX(1-On, 0-Off)
6) Analog input current: AI = X.XX mA
7) A01(IQV) current: A01 = X.XX mA
8) A02(Y) current: A02 = X.XX mA
9) Power on time: EL = X.X h (For monitoring parameter K01)
10) Belt Run time: ED = X.X h (For monitoring parameter K03)
11) L/C input percent: aw = X.XX %
12) Tare/Rated percent: XX.X %
13) Comm. diagnosis: Rx:X Tx: X (Used to count the number of RS485 Modbus communication receiving and sending times)

8. Event Messages

Instrumentation monitors the operation of the system, the left lower part of the screen display the event message. Event display by their priority setting. Call the system menu to display the sub-menu event, you can view event file information. Event code consist one letter and one number.

8.1 System Messages (S)

- S1: Memory Error
- S2: External stop signal is not released. Instruments in a stopped state (parameter Q09)
- S3: Operation and maintenance time exceeded (parameter K03, K04)
- S4: Electric meter operation time exceeded (parameter K01, K02)
- S5: Password is valid, control instruments can still carry out the operation
- S6: Parameter of block P is set improperly (parameter P12)
- S7: Belt cleanup operation starts (parameter R14).

8.2 Electrical Messages E

E1: Power Failure (the power for the instrument error).
E2: GA1 Error (Speed sensor is damaged or disconnected, parameter Q05).
E3: E6: Low battery level. Clock battery low or abnormal

8.3 The detection signal information C

C1: Weighing sensor fault (parameter Q08).
C2: Speed sensor periodic pulse value is too high (parameter Q03).

8.4 The maximum value of the information H

H1: Flow greater than IMAX (parameter F05).
H2: Belt load greater than QMAX (parameter F10).
H3: Belt speed greater than VMAX (parameter F14).
H4: Load cell overload (parameter Q10).
H5: Actual flow exceeded tolerance (parameter R07).
H6: Control output has reached limit values (parameter R08).

8.5 The minimum value of the information L

L1: Flow lower than IMIN (parameter F04).
L2: Belt load lower than QMIN (parameter F07).
L3: Belt speed lower than VMIN (parameter F11).
L4: Load cell empty (parameter Q11).

8.6 Selection Of Event Information Level

The weight level of the event information option.
Ignore: No event indication;
Warning 1: After the event occurs, it must be manually cleared and has a memory function;
Warning 2: After the event occurs, the event is automatically cleared without memory function;
Alarm: Event indication, alarm light on, and stop operation.

Appendices I

The instrument has been done analog input and output standardized calibration in factory. In the use of the site, when the instrumentation connected to PC, PLC or DCS, to avoid numerical difference between the instrument and the current transfer system, you can still re-calibration of the instrument for the current to meet the requirements of field use.

1. Output current calibration

Turn off power, press ▪ till turning on power, when a flash cursor just displays on the screen, input 4.0020 and press ↵, meter will display (AO1=.2mA) on the fist row, with the corresponding DA code value display below:

Cal. A-A AO1=.2mA
0032

1) Calibration for Output current of Analog current AO1 (IQV):
(a) Connect the ammeter (mA) to terminals 9 and 10 of the instrument X9 (9 is GND), adjust the DA value (press the setting key to activate the cursor, then press the setting key to switch the cursor position, and press the up and down keys to increase or decrease the value), so that the output current is 0.2mA. Press the key ↵ to save, and then press the down key, the upper of the screen will display (Cal. A-A AO1=4mA).

Cal. A-A AO1=4mA
0655

(b) Adjust the DA value so that the output current is 4mA, press the ↵ key to save, and then press the down key, the upper of the screen will display (Cal. A-A AO1=20mA)..

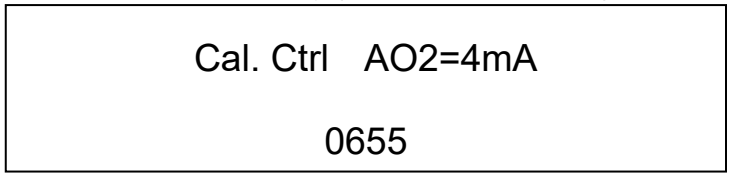
Cal. A-A AO1=20mA
3276

(c) Adjust the DA value so that the output current is 20mA, press the ↵ key to save, and then press the down key, the upper of the screen will display (Cal. Ctrl AO2=.2mA).

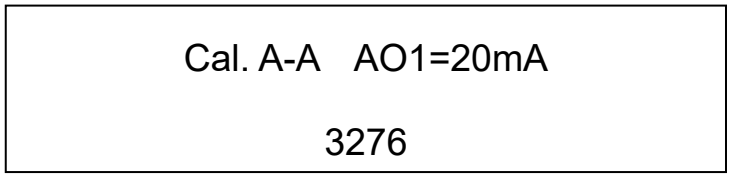
Cal. Ctrl AO2=.2mA
0032

2) Calibration for output current of Feed rate control current AO2 (Y)

(a) Connect the ammeter (mA) to terminals 11 and 12 of the instrument X9 (11 is GND), adjust the DA value so that the output current is 0.2mA. Press the ENT key to save, and then press the down key, the upper of the screen will display (Cal. Ctrl AO2=4mA).



(b) Adjust the DA value so that the output current is 4mA, press the ENT key to save, and then press the down key, the upper of the screen will display (Cal. Ctrl AO2=20mA).

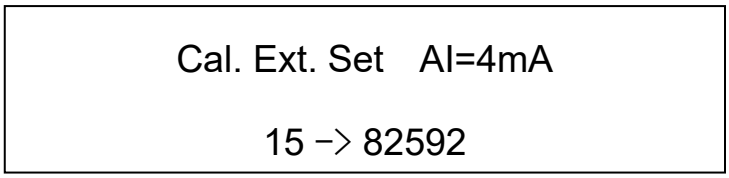


(c) Adjust the DA value so that the output current is 20mA, press the ENT key to save, and then press the exit key  to exit the calibration.

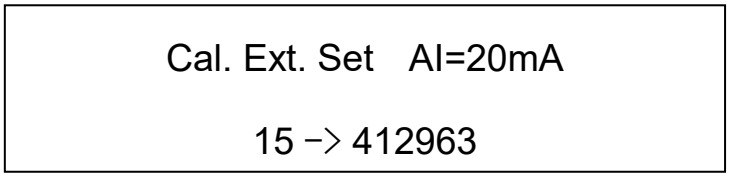
2. Input current calibration

Turn off the power, hold down the  key, turn on the power, and wait until the screen prompts for a password. Enter the password 4.0021, and press the ENT key  to calibrate the flow

setting value. The instrument will display up (Cal. Ext. Set AI=4mA), the left side of the down line will display the real-time AD value, and the right side will display the saved AD value.



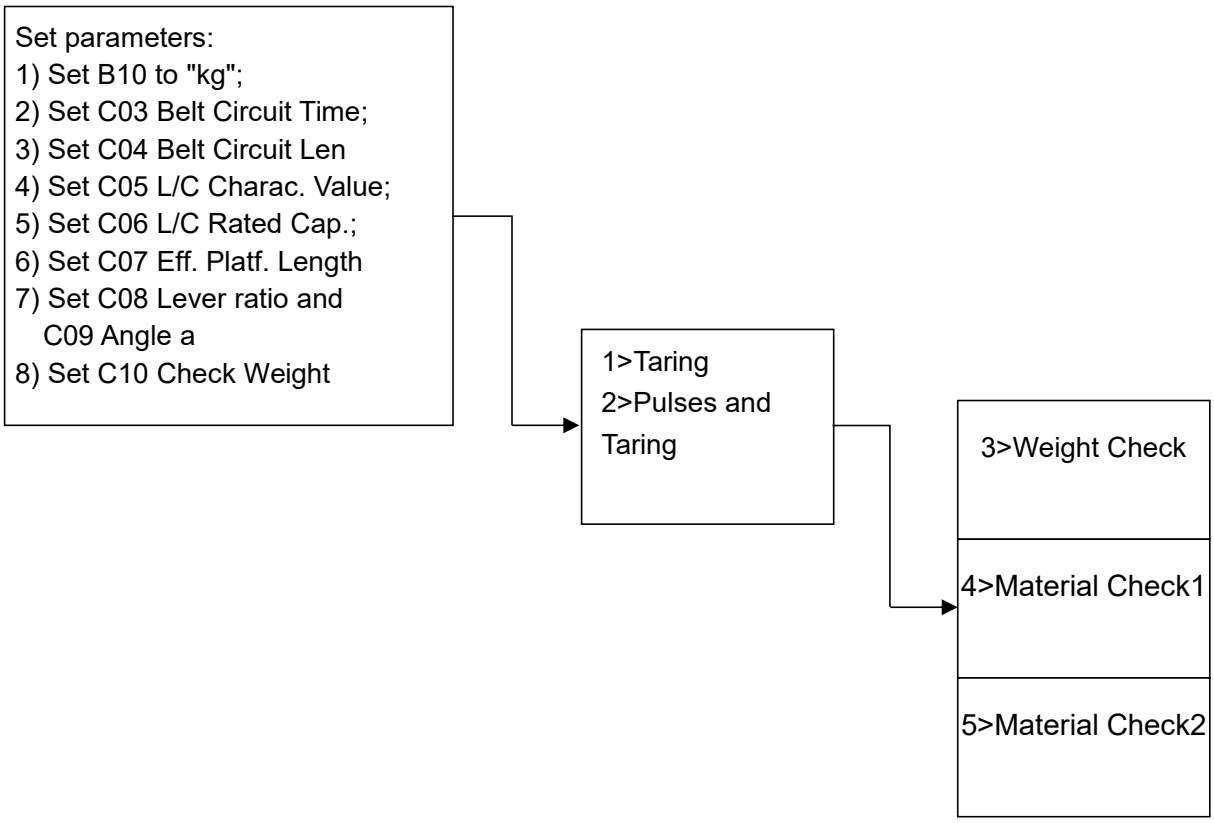
(a) Input a current of 4mA at terminals 7 and 8 (8 being GND) of instrument X4. After the real-time AD value displayed stabilizes, press the ENT key to save it, and then press the down key to display (Cal. Ext. Set AI=20mA).



(b) Input a current of 20mA at terminals 7 and 8 (8 being GND) of instrument X4. After the real-time AD value displayed stabilizes, press the ENT key to save it, and then press the exit key  to exit the calibration.

Appendices II

A How to calibrate the scale:



B Calibrate **method**:

Step 1: Set rated parameters

(1) Start the belt motor (feeder);

(2) Press the menu key to enter the system menu→Press the down key to the "Parameters" →Press the ENT key to enter→Press the down key to "Enter Parameters"→Press the ENT key to enter→Press the number key to input "3.14159"→Press ENT key to confirm→Press the down key to "B>Rated Data"→Press ENT key to confirm→Press the down key to "B10"→Press DAT key to activate the cursor→Press the down key to "kg" ——Press the ENT key to confirm→Press the down key to select "B10.1"→Press DAT key to activate the cursor→Select the desired number of decimal places with the down key- Press the ENT key to confirm;

(3) Press the ESC key→Press the down key to "C>Calibrating Data"→Press the ENT key to confirm→Press the down key to "C03"→ Press DAT key to activate the cursor→Press the number key to input the time required for the belt to rotate for one cycle→Press the ENT key to confirm→Press the down key to "C04"→Press DAT key to activate the cursor →Press the number key to input the belt length→Press the ENT key to confirm→Press the down key to "C05" -Press DAT key to activate the cursor→Press the number key to input the sensitivity of the load cell→Press the ENT key to confirm→Press the down key to "C06"→Press DAT key to activate the cursor→Press the number key to input for L/C Rated Cap.→Press the ENT key to confirm→Press the down key to "C07"→Press DAT key to

activate the cursor→Press the number key to input for Eff. Platf Length→Press the ENT key to confirm -Press the down key to "C08" →Activation key activation→Number key input lever ratio→Press the ENT key to confirm→Press the down key to "C09"→Press DAT key to activate the cursor→Press the number key to input Angle a→Press the ENT key to confirm→Press the down key to "C10"→Press DAT key to activate the cursor→Press the number key to input the weight's weight used in cumulative calibration→Press the ENT key to confirm→Press the ESC key exit to the "System menu".

Step 2: Tare Calibration
Follow the above step (3)→Press the down key to "Calibrat. Functions"→Press the ENT key to confirm→Select "Taring" or "Pulses and Taring" by the down key (Periodic pulse Calibration must be done for the initial Calibration)→Press the ENT key to confirm→Press Number 1 key to confirm the speed→Wait for the belt to run stably and then press Number 2 key to start the Calibration →Wait for the countdown to complete and then press the ENT key to confirm.

Step 3: Accumulated Calibration , physical Calibration 1, physical Calibration 2
Choose one of three calibration methods: cumulative calibration, physical calibration 1, and physical calibration 2.
(1) Follow the above step 2→press the down key to "Weight Check"→press the ENT key to confirm→place weights on the weighing sensor of the belt scale and fix them in place→wait for stable running and press the Number 2 key to start→wait for the countdown to complete, and press the ENT key to confirm→Then press the ESC key to go to the main interface and use the weight that is just used to pass through the measuring section once, to see if the accumulated weight is accurate. If not, repeat the "Weight Check" until it meets the requirements.
(2) Press the down key to "Material Check 1"→Press the ENT key to confirm→Wait for the stabe running and press the Number 2 key to start→Place some materials with known weight through the belt→After the materials have completely passed through the belt, follow the prompts and press the Number 3 key to immediately end or press the Number 5 key to wait for the belt to complete one full circuit before ending→Then input the actual weight of the materials and press the ENT key to confirm.
(3) Press the down key to "Material Check 2"→Press the ENT key to confirm→follow the instrument prompt to input the actual weight of the material and the weight measured on the instrument→ Press the ENT key to confirm.


Start/stop

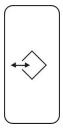
Reset counter


FUNC Enter system menu


Up/down Preselect lower display/ Select functions


DEL Acknowledge event message/ delete input

ESC Abort function, means Interrupting input, Exiting to previous menu



DAT Activate cursor, Prepare input, e.g. of setpoint

ENT Start function, Acknowledge input

Enter parameters

Enter sign and decimal point