

User Manual






EX2005




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
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Safety

- When the instrument is installed, connect an earth bonding conductor from FG to the earth connection marked “”.
- Disconnect the mains power supply before opening the instrument housing.
- To install the optional interface cards, it is necessary to disconnect the mains power supply and fit a yellow/green earth bonding cable to the rear panel.
- Before turning the power on ensure the supply voltage is within the acceptable range, DC24 V.
- The operating ambient temperature range is 0 °C ~ 40 °C (32 °F ~ 104 °F).

Features

EX2005 has a wide range of applications from batching to simple weighing.

Features:

- ◆ Stand alone batching mode or connect to PLC for external system control
- ◆ Built in batching / dosing functions
- ◆ Manual / automatic discharge operation
- ◆ Set cycle times in a batch
- ◆ Totalise weight and number of cycles
- ◆ Key in the signal voltage value (mV / V) directly via the keypad, no need to apply any weight to the bottom work to calibrate the weigher
- ◆ Display load cell output voltage (mV / V) for future maintenance
- ◆ Adjustable filter
- ◆ RS232C bi-directional and RS485 communication
- ◆ Built-in MODBUS (RTU) format

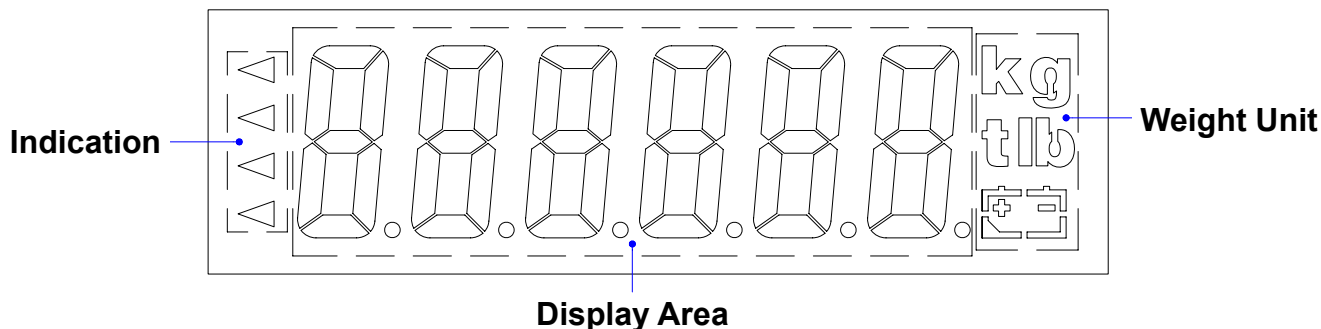
Interface options:

- ◆ OP-01 RS-422 / RS-485 / RS-232 serial interface
- ◆ OP-02-1 BCD parallel output interface (Open collector output)
- ◆ OP-02-2 BCD parallel output interface (TTL output)
- ◆ OP-03 16 Bit Analogue current/voltage output interface (4 ~ 20 mA / 0 ~ 10 V)
- ◆ OP-04 Control I/O (4 In / 4 Out) + Setpoint In (BCD code)
- ◆ OP-05 Control I/O (8 In / 8 Out)



Chapter 1 Front and Rear Panel Specifications

1-1 Front panel



Display

- 6 digits, bright red, 7 segment LED display, character height 16mm (0.63”).
- Display can be switched between Gross Weight / Net Weight / Totalised Weight / Number of transactions in the total.

Indication icons “◀”

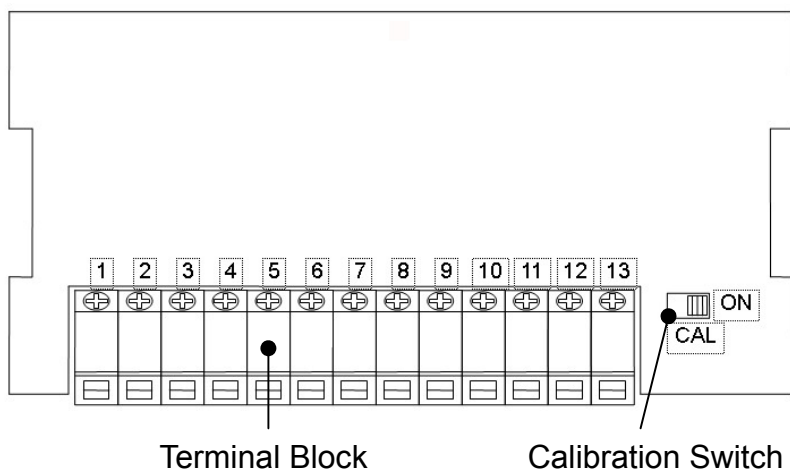
- ZERO ◀ : Zero Indication
- MD ◀ : Unstable weight Indication
- GROSS ◀ : Gross weight Indication
- NET ◀ : Net weight Indication

- ◆ The indicator is supplied with suitable labels to customise the icon displays.
- ◆ Refer to FNC-06 ~ FNC-09 for the various options available.

Weighing Units

- Weighing Units kg / g / t / lb.

1-2 Rear panel



• 13 Way Terminal Block

1 st	FG
2 nd	DC+
3 rd	DC-
4 th	NC
5 th	TX
6 th	RX
7 th	SG
8 th	E+
9 th	SEN+
10 th	E-
11 th	SEN-
12 th	SIG +
13 th	SIG -

- Calibration Switch set to the left is “OFF” and to the right is “ON”

1-3 Keypad Description



- When entering data or reference setting, it means “ESC”.
- In the normal operation, it puts the indicator in standby mode or escape.
- : **Entering standby mode:** All of the display (except ZERO “◀” symbol) and serial data output are disabled.
 - Escape from standby mode:** Re-power on mains for normal operation.



- : When parameter setting, it moves the flashing digit left.
- : In the normal mode, it performs a Zero operation.



- : When parameter setting, it moves the flashing digit right.
- : In the normal mode, it performs a semi-auto Tare operation.



- : When parameter setting, it increments the flashing digit or steps up the
- : select item.
- In the normal mode, it accesses the FNC-05 setting.



- : When parameter setting, it decrements the flashing digit or steps down
- : the select item.
- In the normal mode, it accesses the FNC-04 setting.



- : Confirm / enter key.

- ☰ Function FNC-03 can be used to selectively disable individual keys.
- ☰ Zero operation, will be limited by functions CSP-05 and CSP-10.
- ☰ Zero operation, will be limited by functions CSP-10 and CSP-11.

1-4 A/D Conversion

- * Input Sensitivity : Over 0.12μV/d
- * Internal Resolution : 1 / 1 000 000
- * Max. Sampling Speed : 120 times/s.
- * Application Range : - 0.1 ~ 4.0 mV / V
- * Load Cell Excitation Voltage : 5 V DC ±5%, 120 mA
(Up to eight (8) 350 Ω load cells can be connected)

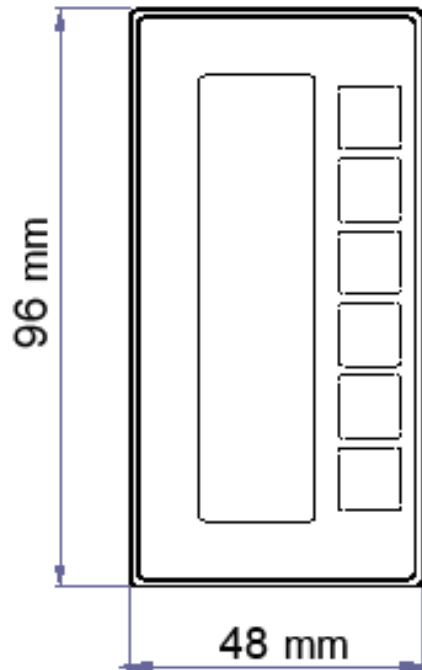
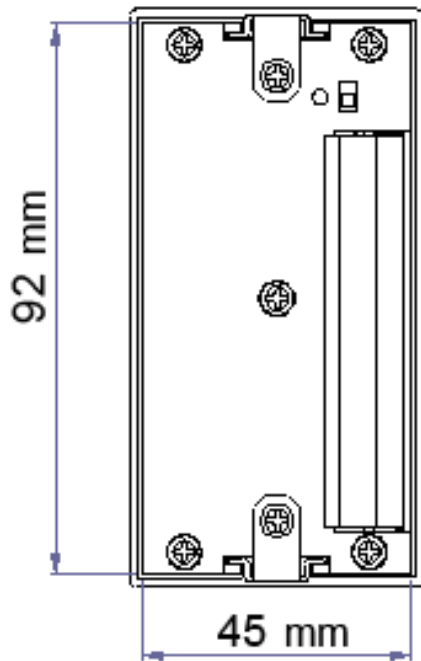
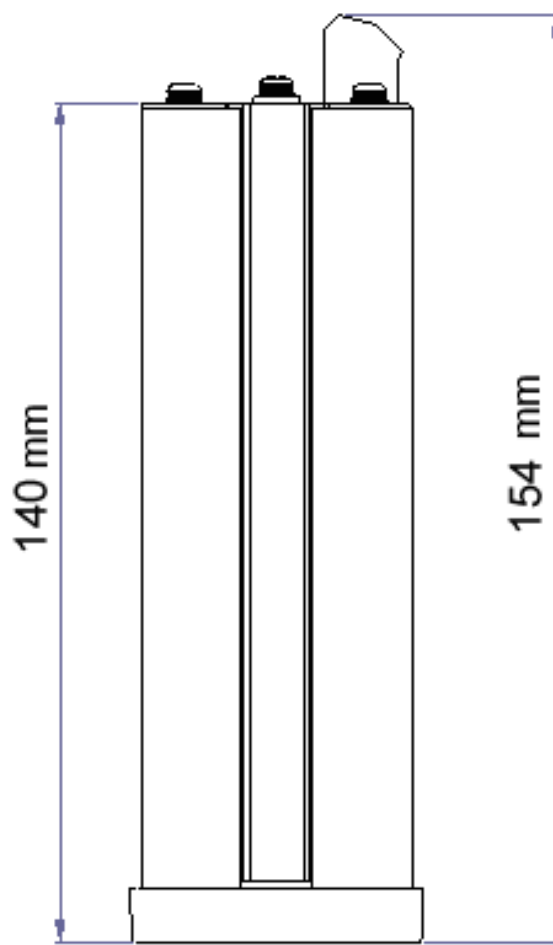
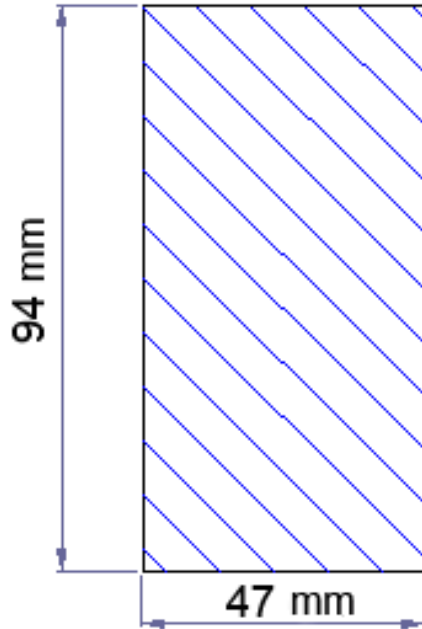
1-5 Power supply

- ◆ DC24 V
- ◆ Power consumption is about 10 VA



1-6 Dimensions

Panel cutout


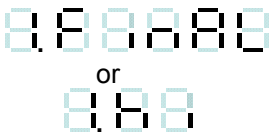










Chapter 2 General Function Guide

2-1 Function Setup and Operation Procedures








Function	Operation	Display	Description
Enter calibration mode	Turn the calibration switch to "ON"	00 888	See 3-2 for details
Enter function setting	Press not release, then press key after the power is turned on	00 888	See 2-2 for details
Reset all parameters back to default	Turn the power on then turn the calibration switch to "ON" then press and hold the and keys during the self-testing sequence	0.888	See 6-1 for details
Reset general function parameters back to default	Turn the power on and press and keys during self-testing sequence	0 888	See 6-2-1 for details
Clear zero point compensation and tare value	Turn the power on and press and keys during self-testing sequence, and then press key	0 8888	See 6-2-2 for details
Clear setpoint parameter setting	Turn the power on and press and keys during self-testing sequence, and then press two times	0 988	See 6-2-3 for details
Value of zero point voltage(mV / V)	Turn the power on and Press and , then press key three times	0 8888	See 6-2-4 for details
Value of Span voltage (mV / V)	Turn the power on and Press and , then Press key	0 8888	See 6-2-5 for details
Entering to test mode	Turn the power on and press and keys during self-testing sequence	0. 888	See 6-3 for details

Function	Operation	Display	Description
Check weighing setpoint parameter setting	Press the  key to set the parameter of FUNC.4 to 1 in the normal mode		See 4-2 for details

Key actions in function set up mode

-  ⇒ Increases the number of the flashing digit
-  ⇒ Decreases the number of the flashing digit
-  ⇒ Moves the flashing digit one space to the left
-  ⇒ Moves the flashing digit one space to the right
-  ⇒ Saves the configuration
-  ⇒ Quits set up mode / Escape

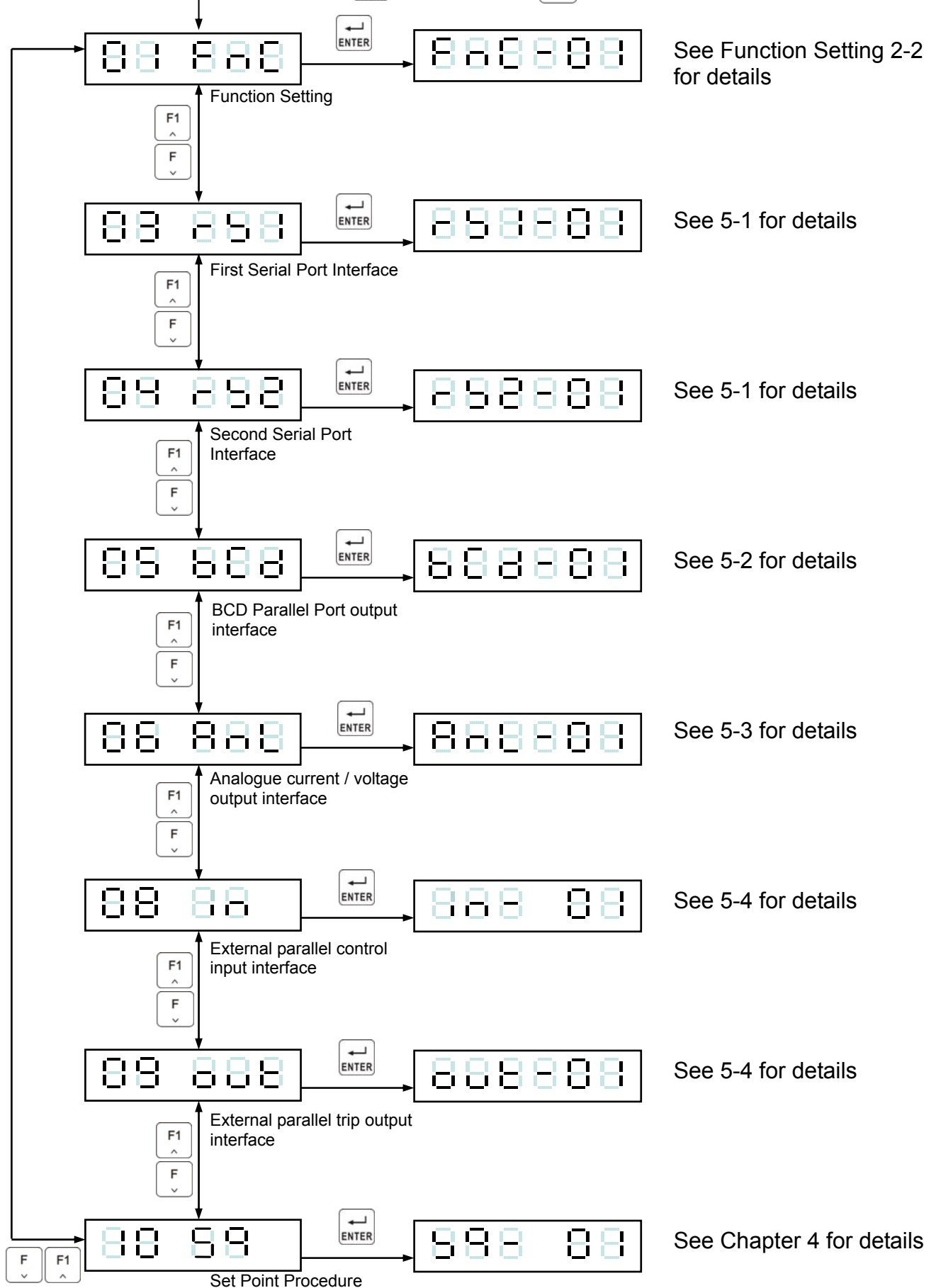
2-2 Error Messages (Display in General Function setting)

-  ⇒ Load Cell output voltage < - 0.1mV / V or > 4mV / V
-  ⇒ Weight value ≤ previous weight value
-  ⇒ Actual measured weight value ≤ previous weight value
-  ⇒ Setting value 0
-  ⇒ mV / V value entered > measuring range
-  ⇒ mV / V value entered is too small (SPAN – Zero < 0 mV / V)
-  ⇒ Displayed resolution is less than 0.12 μV / division



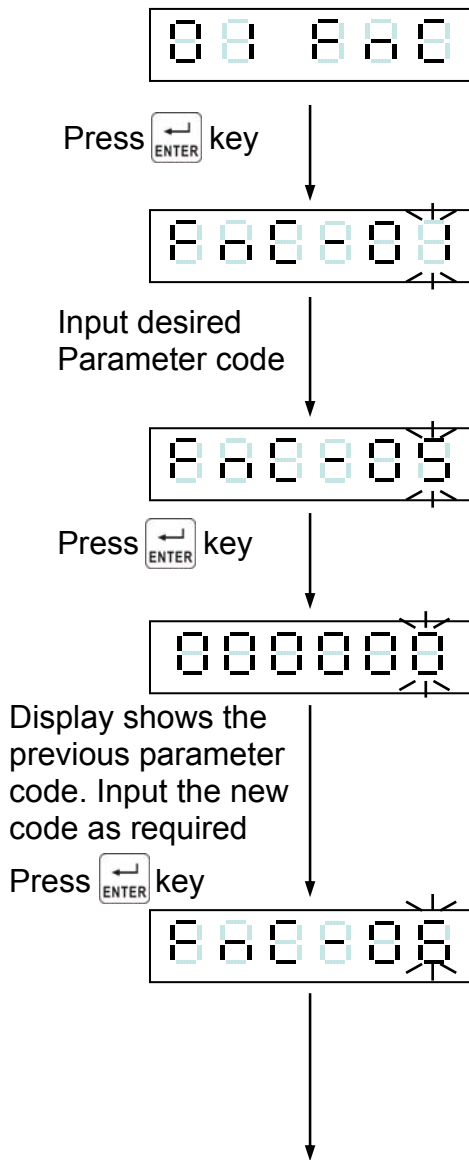
Function Setting Procedures

With weight displayed press and hold the **ENTER** key. Then, press **F** key





2-3 Function Setting 00000



*Function Parameter code

- 000001 ⇒ Digital Filter I
- 000002 ⇒ Digital Filter II
- 000003 ⇒ Lock keypad function
- 000004 ⇒ "F" function setting
- 000005 ⇒ "F1" function setting
- 000006 ⇒ Front panel indication "◀" setting (first)
- 000007 ⇒ Front panel indication "◀" setting (second)
- 000008 ⇒ Front panel indication "◀" setting (third)
- 000009 ⇒ Front panel indication "◀" setting (fourth)
- 000010 ⇒ Terms of back to zero
- 000011 ⇒ Hold
- 000012 ⇒ Rate for display rewrite
- 000013 ⇒ Turn-on zero setting
- 000014 ⇒ Stand-by mode setting
- 000015 ⇒ Zero function record setting

To continue the next function setting

or press key to escape

	⇒ Increment flashing digit
	⇒ Decrement flashing digit
	⇒ Move flashing point left
	⇒ Move flashing point right
	⇒ Store data in memory
	⇒ Exit / Escape



☞ FNC Group function setting

Item	Function	Setting value			Default
		Parameter	Description		
FNC-01	Digital Filter I	0	5 Hz		4
		1	4.17 Hz		
		2	2.5 Hz		
		3	2.08 Hz		
		4	1.25 Hz		
		5	1.04 Hz		
		6	0.63 Hz		
		7	0.52 Hz		
		8	0.31 Hz		
		9	0.26 Hz		
FNC-02	Digital Filter II	0	Disabled		2
		1	Less filter ↑ ↓ Greater		
		2			
		3			
		4			
		5			
FNC-03	Key – Locked	000000 ↓ 111111	0 1	Normal (lock disable) Close (lock enable)	The bits and front panel key positions are related to each other 000000
		Parameter ⇒ Description			
FNC-04	“F” function setting	0 ⇒ Display Net / Gross weight 1 ⇒ Setpoint parameter setting 2 ⇒ Tare reset 3 ⇒ Manual serial, parallel print output 4 ⇒ Start load 5 ⇒ Stop load 6 ⇒ Start comparison 7 ⇒ Unload command 8 ⇒ Totalise weight and counts command 9 ⇒ Clear totalised weight and counts 10 ⇒ Hold mode 11 ⇒ Escape Hold mode(I / O DSP) 12 ⇒ Convert to Gross / Net / totalised weight / totalised Count			1
FNC-05	“F1” function setting				0

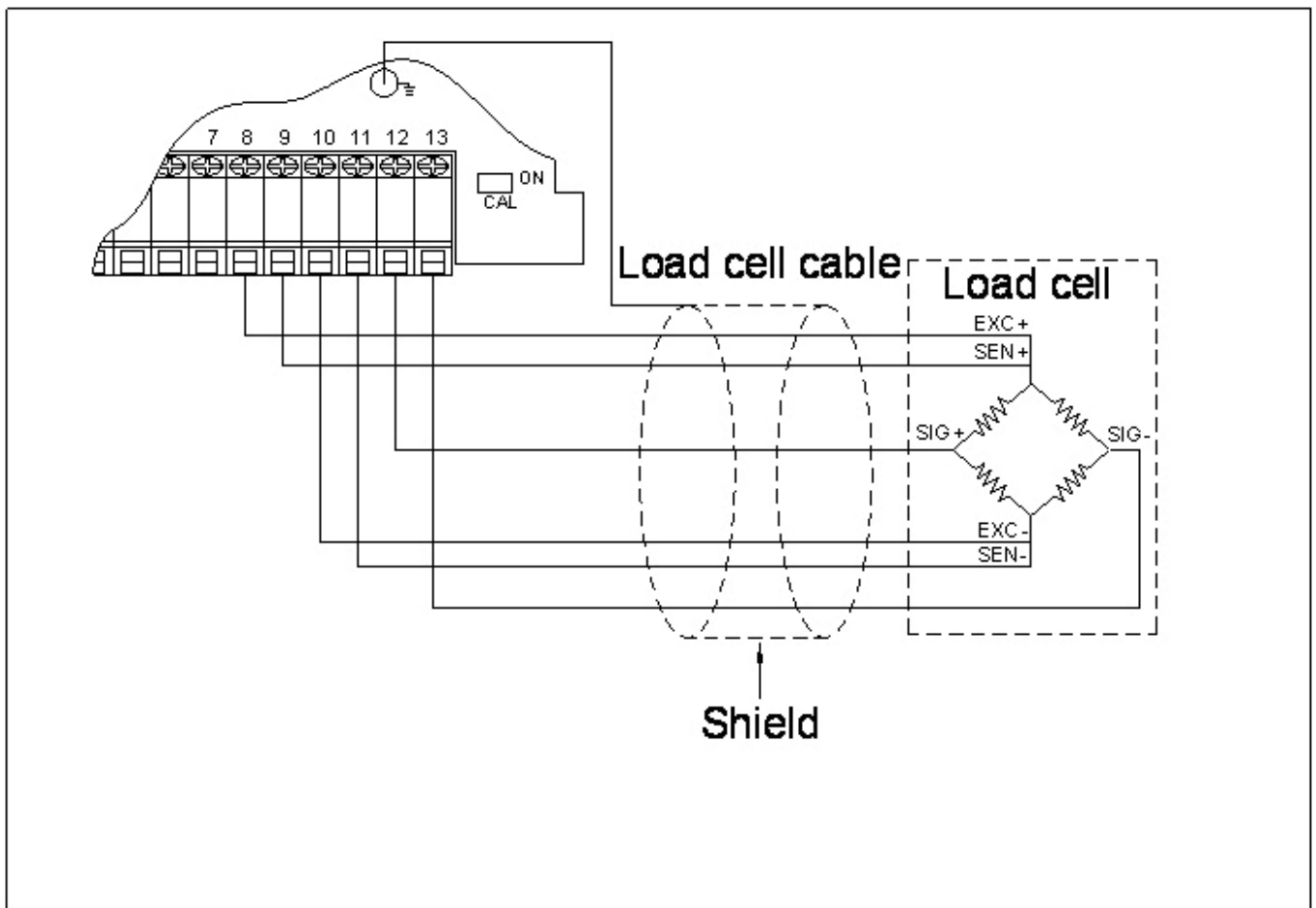
Item	Function	Setting value		Default
		Parameter	Description	
FNC-06	Front panel indication “◀” setting (top)	Parameter ⇒ Description		0
FNC-07	Front panel indication “◀” setting (next to top)	0 ⇒ Zero		
FNC-08	Front panel indication “◀” setting (next to bottom)	1 ⇒ MD		
FNC-09	Front panel indication “◀” setting (bottom)	2 ⇒ Gross		
		3 ⇒ Net		1
		4 ⇒ Totalised weight (Accu. V)		
		5 ⇒ Totalised transactions (Accu. C)		2
		6 ⇒ SP1		
		7 ⇒ SP2		3
		8 ⇒ SP3		
		9 ⇒ Hi		0
		10 ⇒ OK		
		11 ⇒ Lo		0
		12 ⇒ Under		
		13 ⇒ Over		0
		14 ⇒ Discharge		
		15 ⇒ Running		0
		16 ⇒ Hold		
FNC-10	Return to zero band (d: refer to CSP-03)	0	5 d	0
		1	10 d	
		2	20 d	
		3	40 d	
		4	60 d	
		5	80 d	
		6	100 d	
		7	150 d	
		8	200 d	
		9	250 d	
FNC-11	Hold	0	Hold	0
		1	Peak hold (positive 1)	
		2	Peak hold (negative)	
		3	Peak hold (absolute value)	
		4	Peak hold (positive 2)	
FNC-12	Rate for display rewrite	0	No limitation	0
		1	20 times/s	
		2	10 times/s	
		3	5 times/s	
		4	1 time/s	



Item	Function	Setting value		Default
		Parameter	Description	
FNC-13	Turn-on zero setting	0	Disable	0
		1	Enable	
FNC-14	Stand-by mode setting	0	Disable all the functions under stand-by mode	0
		1	Only turn off display but not disable other functions under stand-by mode	
FNC-15	Zero function record setting	0	Zero point record not saved into EEPROM	0
		1	Zero point record saved into EEPROM	

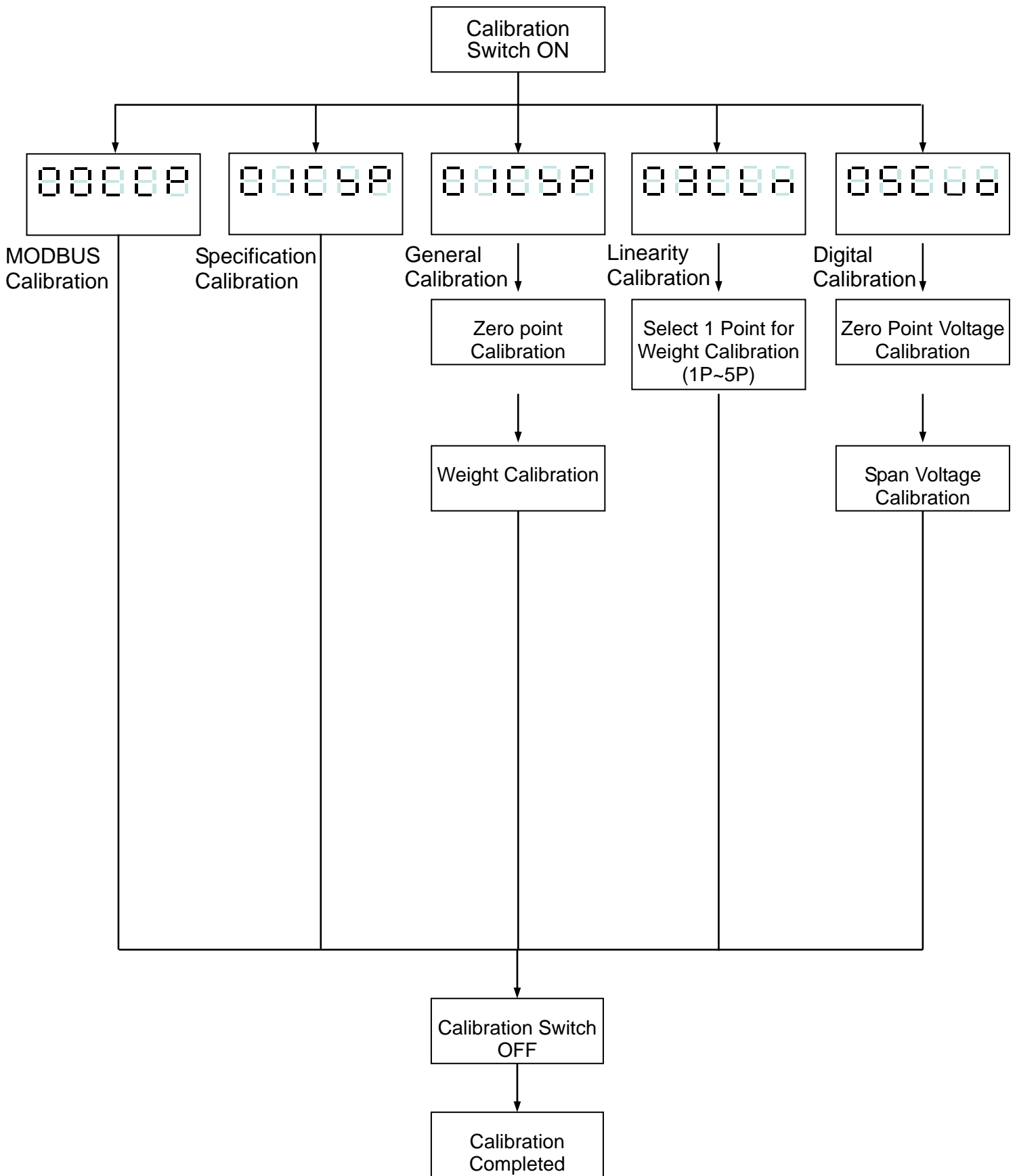
Chapter 3 Calibration

3-1 Load Cell Connection



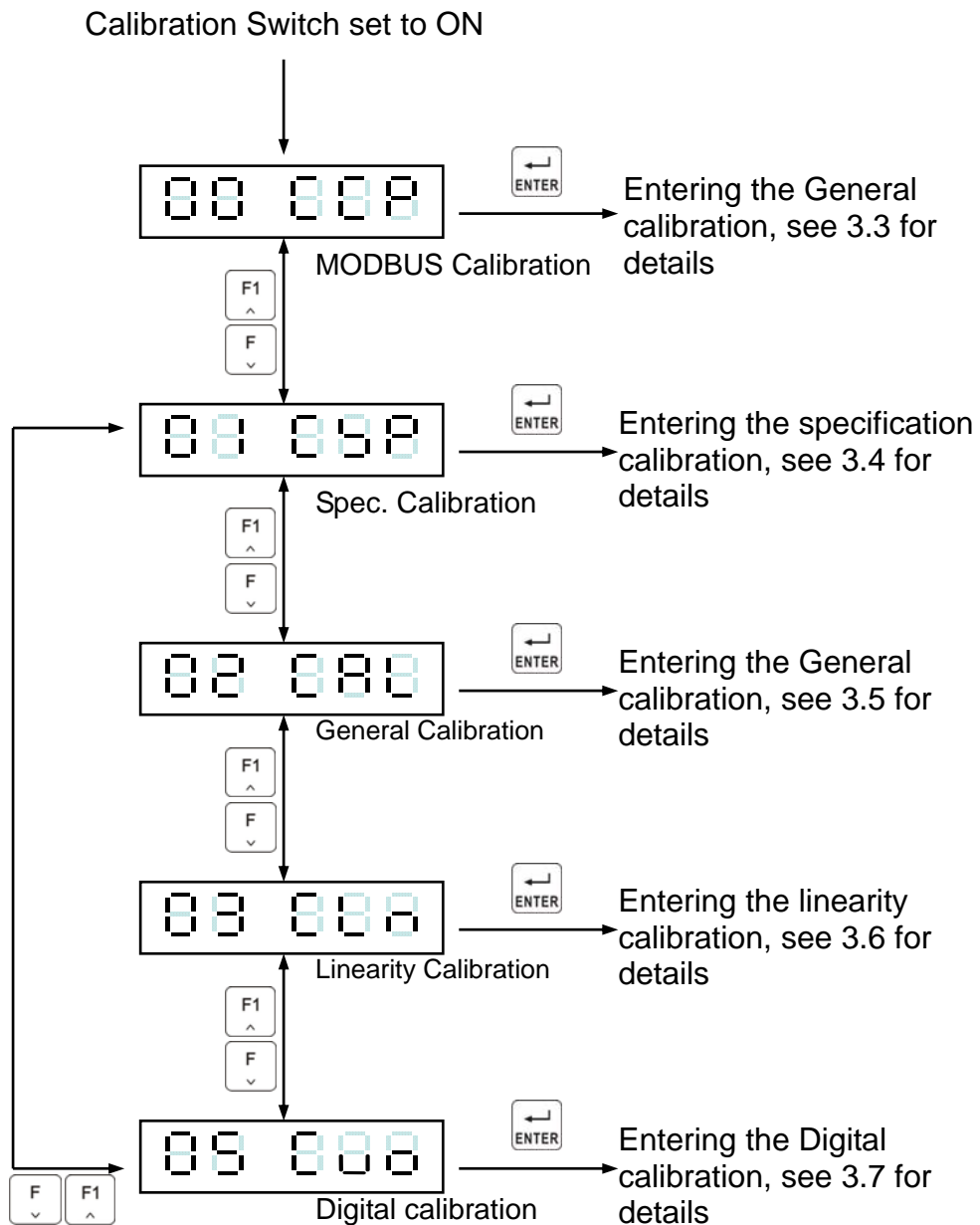


3-2 Parameter Setting and Calibration Flow Chart





☞ Calibration process

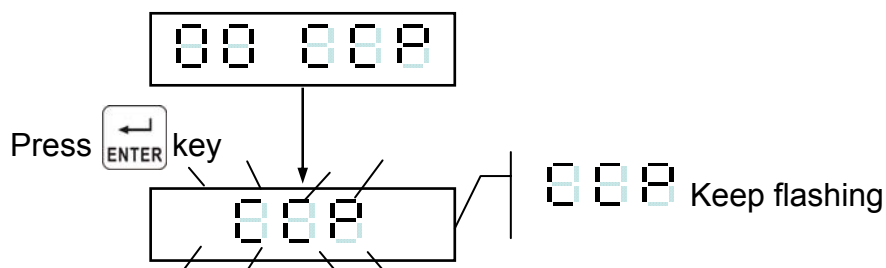


☞ Before the Linearity Calibration, the General Calibration should be completed.



3-3 MODBUS Calibration

- RS1-02 set as “4” (MODBUS RTU mode)
- RS1-07 set as “01” (address)



Eg:

Zero calibration

Input 01050423FF007CC0 ← zero calibration

Reading calibration status

Input 0101004100565AC1D ← Refer to “Appendix 3: MODBUS data address table”

The zero calibration is finished, and there should be no Err message appeared.

Span calibration

Input weight calibration value 3000

Input 0110044C0001020BB8EADE ← Input weight calibration value 3000

Put 3kg on the platter

Span calibration

Input 01050424FF00CD01 ← Span calibration

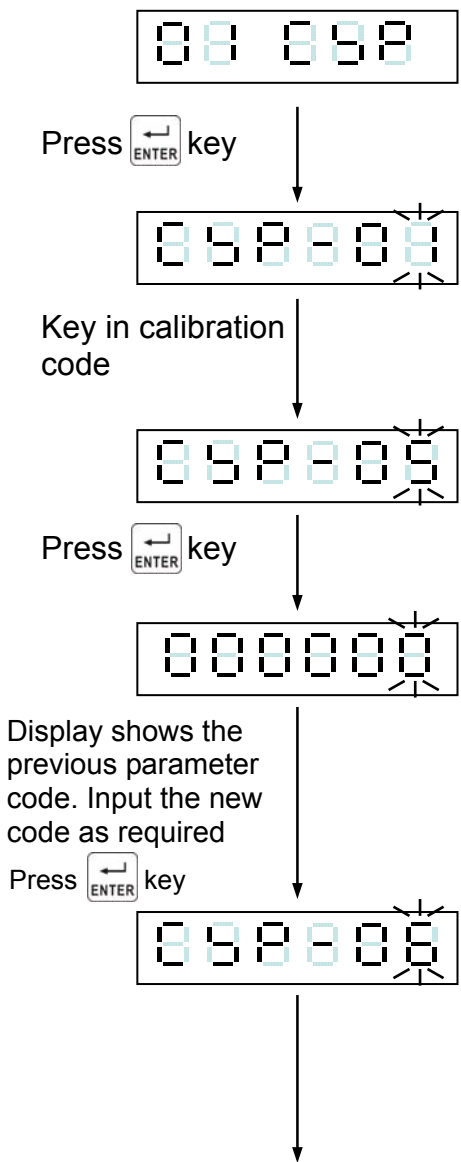
Reading calibration status

Input 0101004100565AC1D ← Refer to “Appendix 3: MODBUS data address table”

The span calibration is finished, and there should be no Err message appeared.



3-4 Specification calibration 00000



*Calibration parameter code

- 000000 ⇒ Unit
- 000001 ⇒ Decimal Point
- 000002 ⇒ Min. Division
- 000003 ⇒ Max. Capacity
- 000004 ⇒ Zero Range
- 000005 ⇒ Time of Zero tracking
- 000006 ⇒ Range of Zero tracking
- 000007 ⇒ Investigate period of unstable
- 000008 ⇒ Investigate range of unstable
- 000009 ⇒ Function Zero and Tare when the weight is unstable
- 000010 ⇒ Tare function availability when gross weight is negative

To continue the next function setting

or press key to escape

	⇒ Increment flashing digit
	⇒ Decrement flashing digit
	⇒ Move flashing point left
	⇒ Move flashing point right
	⇒ Store data in memory
	⇒ Exit / Escape



Item	Function	Setting value		Default
		Parameter	Description	
CSP-01	Unit	0	None	2
		1	g	
		2	Kg	
		3	t	
		4	lb	
CSP-02	Decimal Point	0	None	0
		1	1 Decimal Point	
		2	2 Decimal Point	
		3	3 Decimal Point	
CSP-03	Division	1	Division size	1
		2		
		5		
		10		
		20		
		50		
CSP-04	Max. Capacity	999999 ↓ 000000	Max. capacity	999999
CSP-05	Zero range	0 =full range (±1%~30%)	Zero range = calibration zero point ± (Max. capacity×setting value %)	0
CSP-06	Time of zero tracking	0.0 ~ 5.0 (sec)	Time and range of zero tracking should be use at the same time. If the time is set to 0.0, the zero tracking function is disabled	1.0
CSP-07	Range of zero tracking	0 ~ 9	Range of zero tracking = (setting value×½)D , D=min. division Range and time of zero tracking should be use at the same time. If the range is set to 0, the zero tracking function is disabled	2
CSP-08	Investigate time in stable	0.0 ~ 5.0 (sec)	Investigate time and range should be use at the same time. If the time is set to 0.0, the investigate time is disabled	1.0
CSP-09	Investigate range in stable	0 ~ 9	Investigate time and range should be use at the same time. If the range is set to 0, the investigate range is disabled	2
CSP-10	Weight unstable, function ZERO and TARE	0	Action	0
		1	None	
CSP-11	Gross Weight is negative, function TARE	0	Action	0
		1	None	



3-5 General Calibration 00000

Set CAL switch to ON



Select General Calibration

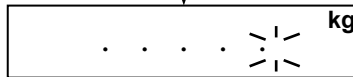


Press Key



Zero Calibration
No weight on the platform
or in the hopper

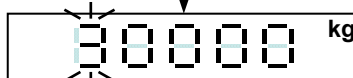
Press the key



Five sec. later



Two sec. later

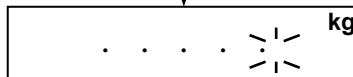


Weight Calibration

Use the front panel to key in the weight value
Place the weight on the platform or inside the hopper

After the weight is stable

Press the key



Five sec. later



Calibration complete set calibration switch to the OFF position

	⇒ Increment flashing digit
	⇒ Decrement flashing digit
	⇒ Move flashing point left
	⇒ Move flashing point right
	⇒ Store data in memory
	⇒ Exit / Escape

- Zero calibration only, press key to escape after the display shows 9999.
- Span calibration only, press key entering directly to span calibration after the display shows 30000 .
- Please refer to error message during calibration of the display show 000.X .



3-6 Linearity calibration 00000

Before the Linearity calibration, the General calibration should be completed.

Set CAL switch to ON

Select linearity calibration

Press the key

Select one of five calibration, and

Press the key

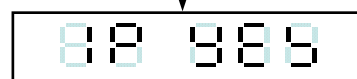
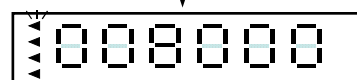
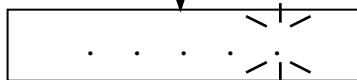
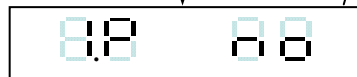
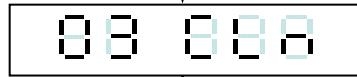
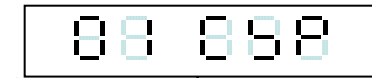
Press the key

Key in the correct weight value

Press the key

When stable, the display area shows the modified weight value

Press the key



Use to select one of calibration points (1P~5P)

: no setting value
 : with setting value

Press the key

Press the key

	⇒ Increment flashing digit
	⇒ Decrement flashing digit
	⇒ Move flashing point left.
	⇒ Move flashing point right
	⇒ Store data in memory
	⇒ Exit / Escape

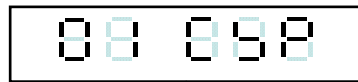
Finish the 1st calibration point setting. Either continues the second point calibration or press key to exit the linearity calibration process

Please refer to the error message list if the display shows .

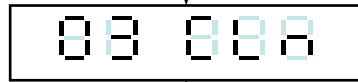


☞ Display the setting value of linearity calibration

Set CAL switch to ON



Select linearity calibration



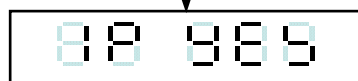
Press the key



Press the key



Press the key



Either continue to display the second point value or press key to exit the linearity calibration mode

Use to select one of calibration points (1P~5P)

: no setting value
 : with setting value

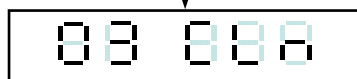
Display the setting value of this calibration point

☞ Clear the setting value of linearity calibration

Set CAL switch to ON



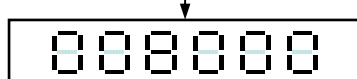
Select linearity calibration



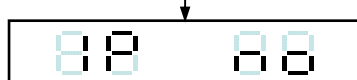
Press the key



Press the key



Press the key



Either continue to clear the second point value or press key to exit the linearity calibration mode

Use keys to select one of calibration. (1P~5P)

→ No setting value
 → With setting value

The screen shows the setting

	→ Increment flashing digit
	→ Decrement flashing digit
	→ Move flashing point left
	→ Move flashing point right
	→ Store data in memory
	→ Exit / Escape

☞ Please refer to the error message list if the display shows .



3-7 Digital calibration 00 000

Set CAL switch to ON



Select Digital calibration

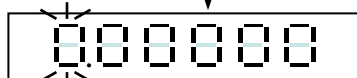


Press the Key



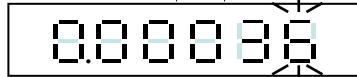
Zero voltage calibration

Two sec. later



Method 1
Input zero voltage

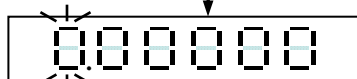
Method 2
With no weight on the platform or in the hopper
press the key to set zero.



Press the key

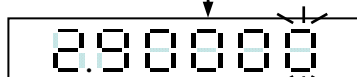


Two sec. later



Span voltage calibration

Input the span voltage



Press the key



Two sec. later



Enter the weighing capacity



Press the key

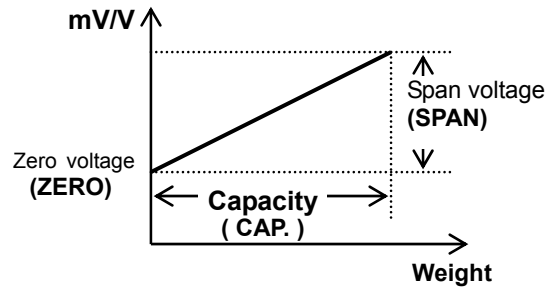


Display shows nothing after calibration

Calibration completed set calibration switch to the OFF position

Please refer to the error message list if the display shows 000.X.

Example:



Zero Voltage \Rightarrow 0.00036 mV/V (incl. dead load)
 Span Voltage \Rightarrow 2.90000 mV/V
 Capacity \Rightarrow 30 000 divisions

- \Rightarrow Increment flashing digit
- \Rightarrow Decrement flashing digit
- \Rightarrow Move flashing point left
- \Rightarrow Move flashing point right
- \Rightarrow Store data in memory
- \Rightarrow Exit / Escape



Chapter 4 Weight Comparison Procedures

4-1 Function Configuration Menu

*Item code

<p>Press the key</p> <p>Select the desired menu code</p> <p>Press the key</p> <p>Display shows the existing parameter code. Input a new code as required</p> <p>Press the key</p> <p>Continue to another function Setting or press key to save and exit</p>	 	<p>588 08 ⇒ Batching mode</p> <p>588 02 ⇒ Batching start delay time</p> <p>588 03 ⇒ Compare SP1 & SP" waiting time</p> <p>588 04 ⇒ Batch finishes output signal delay time</p> <p>588 05 ⇒ Batch finish condition</p> <p>588 06 ⇒ Batch finish output signal duration</p> <p>588 07 ⇒ Supplementary load times</p> <p>588 08 ⇒ Supplementary loading gate open time</p> <p>588 09 ⇒ Supplementary loading gate closed time</p> <p>588 10 ⇒ Discharge start delay time</p> <p>588 11 ⇒ Discharge stop delay time</p> <p>588 12 ⇒ Discharge time</p> <p>588 13 ⇒ Restart delay time</p> <p>588 14 ⇒ Batching times</p> <p>588 15 ⇒ Weight completed value in Zero band</p> <p>588 16 ⇒ Hi, OK, Lo action mode</p> <p>588 17 ⇒ Auto totalise weight / counts</p> <p>588 18 ⇒ The parameter source for weight comparison</p> <p>588 19 ⇒ Weight comparison delay time</p> <p>588 20 ⇒ Tare auto</p> <p>588 21 ⇒ Discharge auto</p>
---	------------------	--

	⇒ Increment flashing digit
	⇒ Decrement flashing digit
	⇒ Move flashing point left
	⇒ Move flashing point right
	⇒ Store data in memory
	⇒ Exit / Escape



Functional Parameter Instruction

Item	Function	Setting value		Default
		Parameter	Description	
SQ- 01	Batching mode	1	Normal batch	1
		2	Loss-in weight	
		3	Comparison mode	
		4	Normal batch (Built-in program)	
		5	Loss-in weight (Built-in program)	
		6	Hold mode (Built-in program)	
SQ- 02	Batching start delay time	0.0 ~ 25.5 (sec)	The built-in auto-program starts the batch comparison procedure after the input of the batch start signal	0.0
SQ- 03	SP1,SP2 Waiting time comparison	0.0 ~ 25.5 (sec)	No full flow comparison during this function's set time period. If the set value is 0, indicates this function is not in use	0.0
SQ- 04	Batch finish output signal delay time	0.0 ~ 25.5 (sec)	Output the batch finished signal after this delay time	0.5
SQ- 05	Batch finish Condition	0	Wait until the weight is stabilized	0
		1	No need to wait until the weight has stabilized	
SQ- 06	Batch finish Output signal time	0.0 ~ 25.5 (sec)	Batch finished output signal time. If set to 0, the output signal will be off until the next batch start	1.0
<p>Batch finish signal</p> <p>ON</p> <p>OFF</p> <p>Batch finish</p> <p>SQ 04</p> <p>SQ 06</p>				
SQ- 07	Number of Times the supplementary loading function operates	0 ~ 255	If the set value is 0, this function is not in use	0
SQ- 08	Supplementary loading gate open time	0.0 ~ 25.5 (sec)	Must be coordinate with times of supplementary loading, (SQ- 07)	0.1
SQ- 09	Supplementary loading gate close time	0.0 ~ 25.5 (sec)	Must be coordinate with times of supplementary loading, (SQ- 07)	1.0
<p>Supplementary loading signal</p> <p>ON</p> <p>OFF</p> <p>SQ- 08</p> <p>SQ- 09</p> <p>SQ- 08</p> <p>SQ- 09</p> <p>SQ- 07 Times of "ON" of the supplementary loading</p>				



Item	Function	Setting value		Default
		Parameter	Description	
SQ- 10	Discharge start delay time	0.0 ~ 25.5 (sec)	Delay time before Discharge signal is ON	0.0
SQ- 11	Discharge stop delay time	0.0 ~ 25.5 (sec)	Delay time before Discharge signal is OFF	0.0
SQ- 12	Discharge time	0.0 ~ 25.5 (sec)	Won't activate internal discharge control function, if set to 0	0
SQ- 13	Restart delay time	0.0 ~ 25.5 (sec)	Delay time before Restart signal is ON	1.0
SQ- 14	Batching counts	0 ~ 255 (times)	Number of batch runs 0 ⇒ one batch only	0
SQ- 15	Set the zero band in to final weighing value	0	No setting	0
		1	Setting	
SQ- 16	Hi, OK, Lo	0	Comparison anytime	0
		1	To compare at batch finish	
		2	To compare at external input signal	
		3	To compare at batching finish and external input signal	
		4	Comparison auto	
SQ- 17	Auto totalise weight / counts	0	Disabled	0
		1	Enabled	
SQ- 18	The parameter source in weight comparison	0	Key in directly from front keypad	0
		1	Input directly from rear interface	
SQ- 19	Weight comparison delay time	0.0 ~ 25.5 (sec)	Comparison delay time for Hi, OK, Lo	0.5
SQ- 20	TARE auto.	0	Press keypad TARE to TARE	0
		1	TARE auto	
SQ- 21	Discharge auto	0	Input from external input or keypad	0
		1	Discharge auto + manual	



4-2 Check Weighing Configuration

1. FNC-04 = 1, SQ-01 = 1, 2, 4 or 5

Press the key →

↓
 →

Display shows the existing **Final value** setting, Input new value as required.

Press the key →

↓
 →

Display shows the existing **SP1 value** setting, Input new value as required.

Press the key →

↓
 →

Display shows the existing **SP2 value** setting, Input new value as required.

Press the key →

↓
 →

Display shows the existing **Free Fall value** setting, Input new value as required.

Press the key →

↓
 →

Display shows the existing **Over value** setting, Input new value as required.

Press the key →

↓
 →

↓
 →

Display shows the existing **Under value** setting. Input new value as required.

Press the key →

↓
 →



Display shows the existing **Zero Band** setting. Input new value as required.

Press the key →

	→ Increment flashing digit
	→ Decrement flashing digit
	→ Move flashing point left
	→ Move flashing point right
	→ Store data in memory
	→ Exit / Escape



2. FNC-04 = 1, SQ-01 = 3

Press the  Key → 






Display shows the existing **Hi value** setting, Input new value as required.

Press the  key








Display shows the existing **Lo value** setting, Input new value as required.

Press the  key













Display shows the existing **Zero Band** setting. Input new value as required.

Press the  key



	⇒ Increment flashing digit
	⇒ Decrement flashing digit
	⇒ Move flashing point left
	⇒ Move flashing point right
	⇒ Store data in memory
	⇒ Exit / Escape



3. FNC-04 = 1, SQ-01 = 6

Press the key →



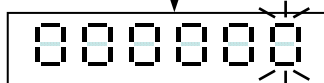
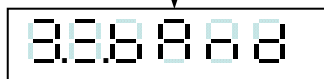
Display shows the existing **Hi value** setting,
Input new value as required.

Press the key



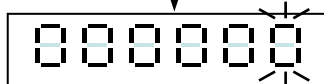
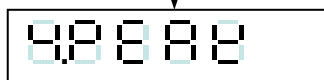
Display shows the existing **Lo value** setting,
Input new value as required.

Press the key



Display shows the existing **Zero Band**
setting, Input new value as required.

Press the key



Display show the existing **Peak Ready**
value setting. Input new value as required.

Press the key



	⇒ Increment flashing digit
	⇒ Decrement flashing digit
	⇒ Move flashing point left
	⇒ Move flashing point right
	⇒ Store data in memory
	⇒ Exit / Escape



4-3 Batching Signal Outputs

☞ Normal batching signal outputs

Signal	Output condition
SP1	$\text{Net} \geq \text{Final}(\text{value}) - \text{SP1}(\text{value})$
SP2	$\text{Net} \geq \text{Final}(\text{value}) - \text{SP2}(\text{value})$
SP3	$\text{Net} \geq \text{Final}(\text{value}) - \text{Free Fall (in-flight)} (\text{value})$
Under	$\text{Net} < \text{Final}(\text{value}) - \text{Under}(\text{value})$
Over	$\text{Net} \geq \text{Final}(\text{value}) + \text{Over}(\text{value})$
Zero Band	$\text{Gross} \leq \text{Zero Band}(\text{value})$

☞ Loss-in-weight signal outputs

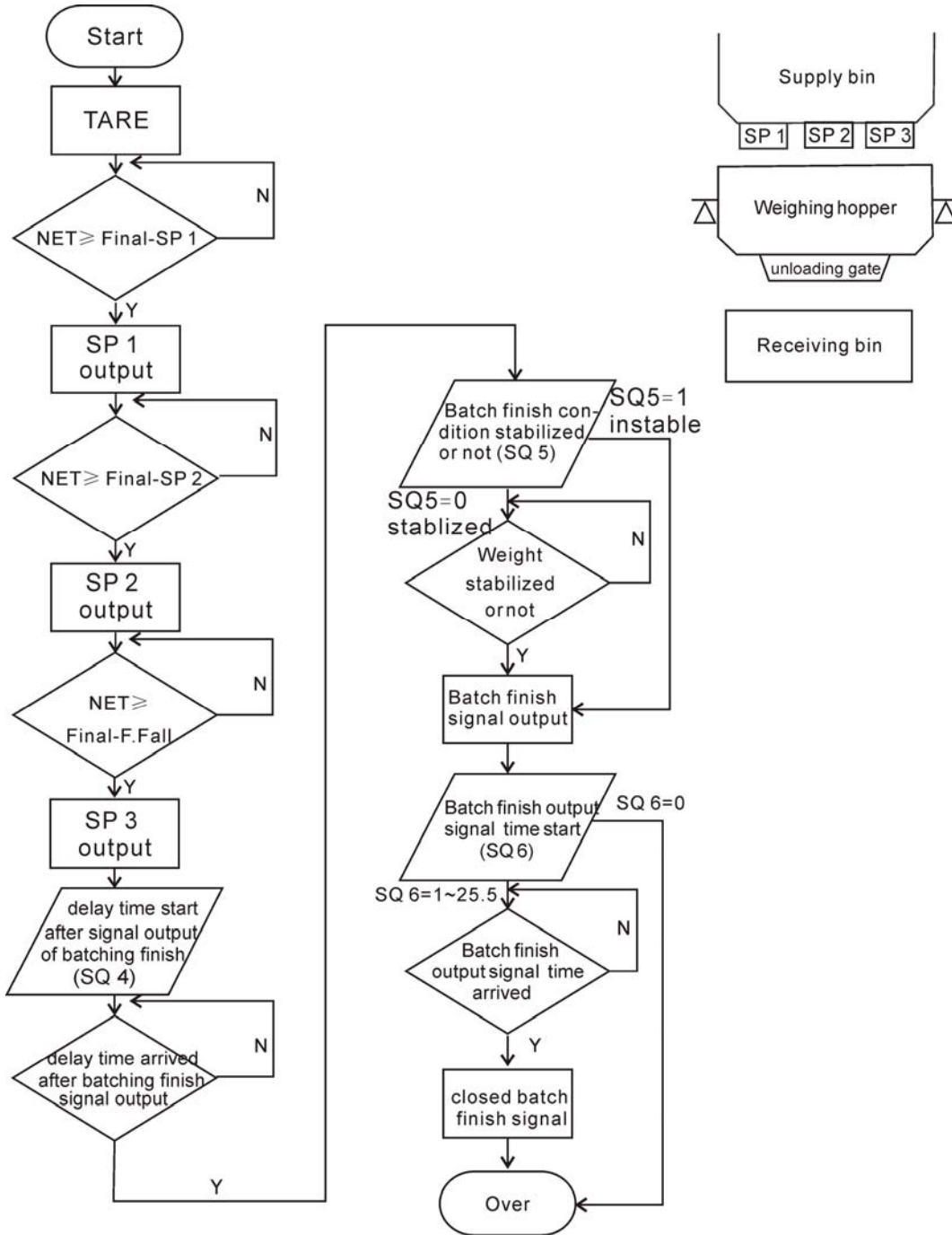
Signal	Output condition
SP1	$\text{Gross} \geq \text{SP1}(\text{value})$
SP2	$-\text{Net} \geq \text{Final}(\text{value}) - \text{SP2}(\text{value})$
SP3	$-\text{Net} \geq \text{Final}(\text{value}) - \text{Free Fall (in-flight)} (\text{value})$
Under	$-\text{Net} < \text{Final}(\text{value}) - \text{Under}(\text{value})$
Over	$-\text{Net} \geq \text{Final}(\text{value}) + \text{Over}(\text{value})$
Zero Band	$\text{Gross} \leq \text{Zero Band}(\text{value})$

☞ Hi, OK, Lo signal outputs

Setting		Signal	Output condition
SQ01	SQ16		
1,2,4,5	1,3	Under	$\text{Net} < \text{Final}(\text{value}) - \text{Under}(\text{value})$
3	0,2,4		$\text{Net} < \text{Lo}(\text{value})$
1,2,4,5	1,3	Over	$\text{Net} \geq \text{Final}(\text{value}) + \text{Over}(\text{value})$
3	0,2,4		$\text{Net} \geq \text{HI}(\text{value})$
1,2,4,5	1,3	OK	$\text{Final}(\text{value}) - \text{Under}(\text{value}) \leq \text{Net} < \text{Final}(\text{value}) + \text{Over}(\text{value})$
3	0,2,4		$\text{Lo}(\text{value}) \leq \text{Net} < \text{Hi}(\text{value})$
1,2,4,5	1,3	LO	$\text{Net} < \text{Final}(\text{value}) - \text{Under}(\text{value})$
3	0,2,4		$\text{Net} < \text{Lo}(\text{value})$
1,2,4,5	1,3	HI	$\text{Net} \geq \text{Final}(\text{value}) + \text{Over}(\text{value})$
3	0,2,4		$\text{Net} \geq \text{HI}(\text{value})$

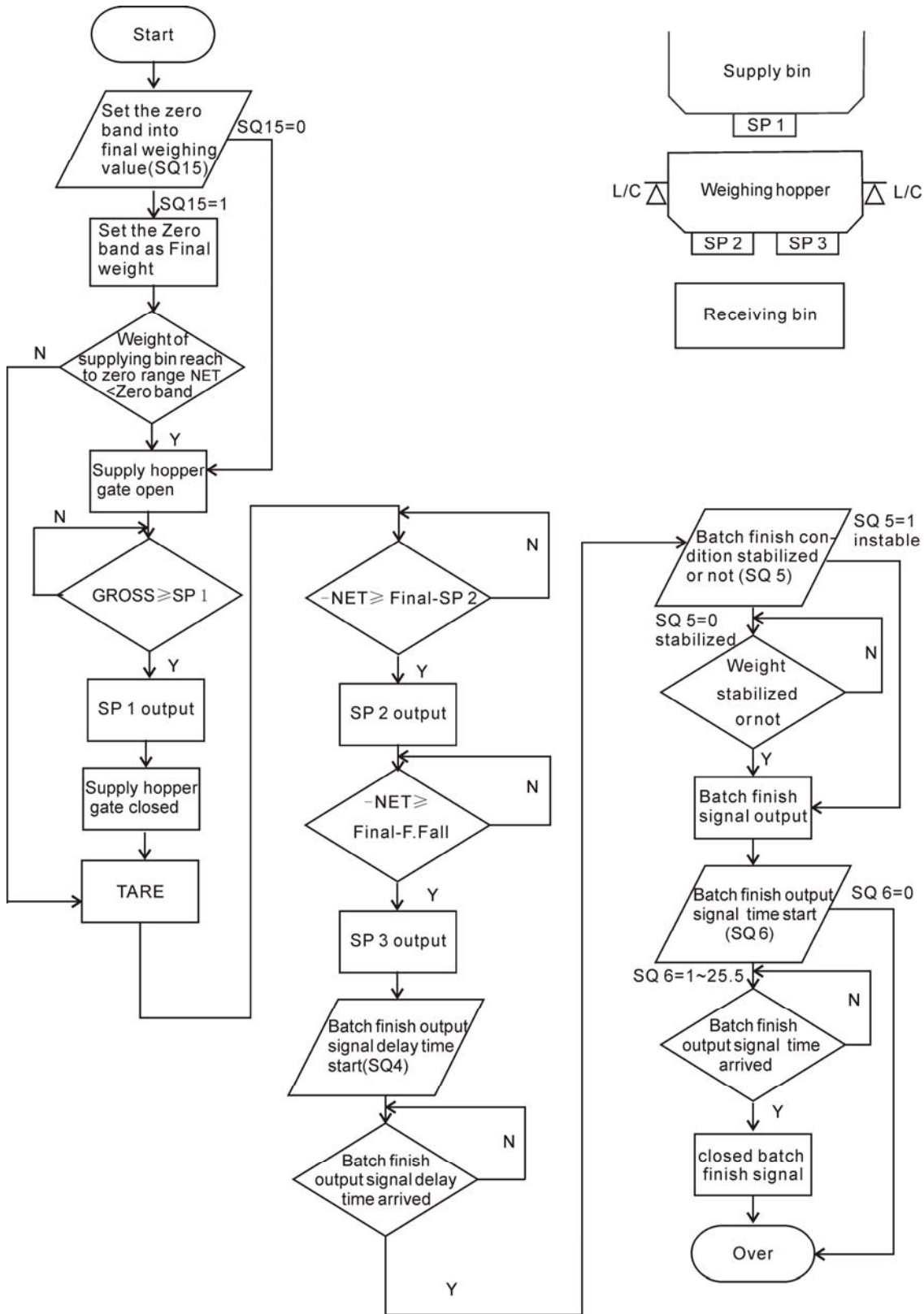


4-4 Normal batching flow chart (SQ-01=1)



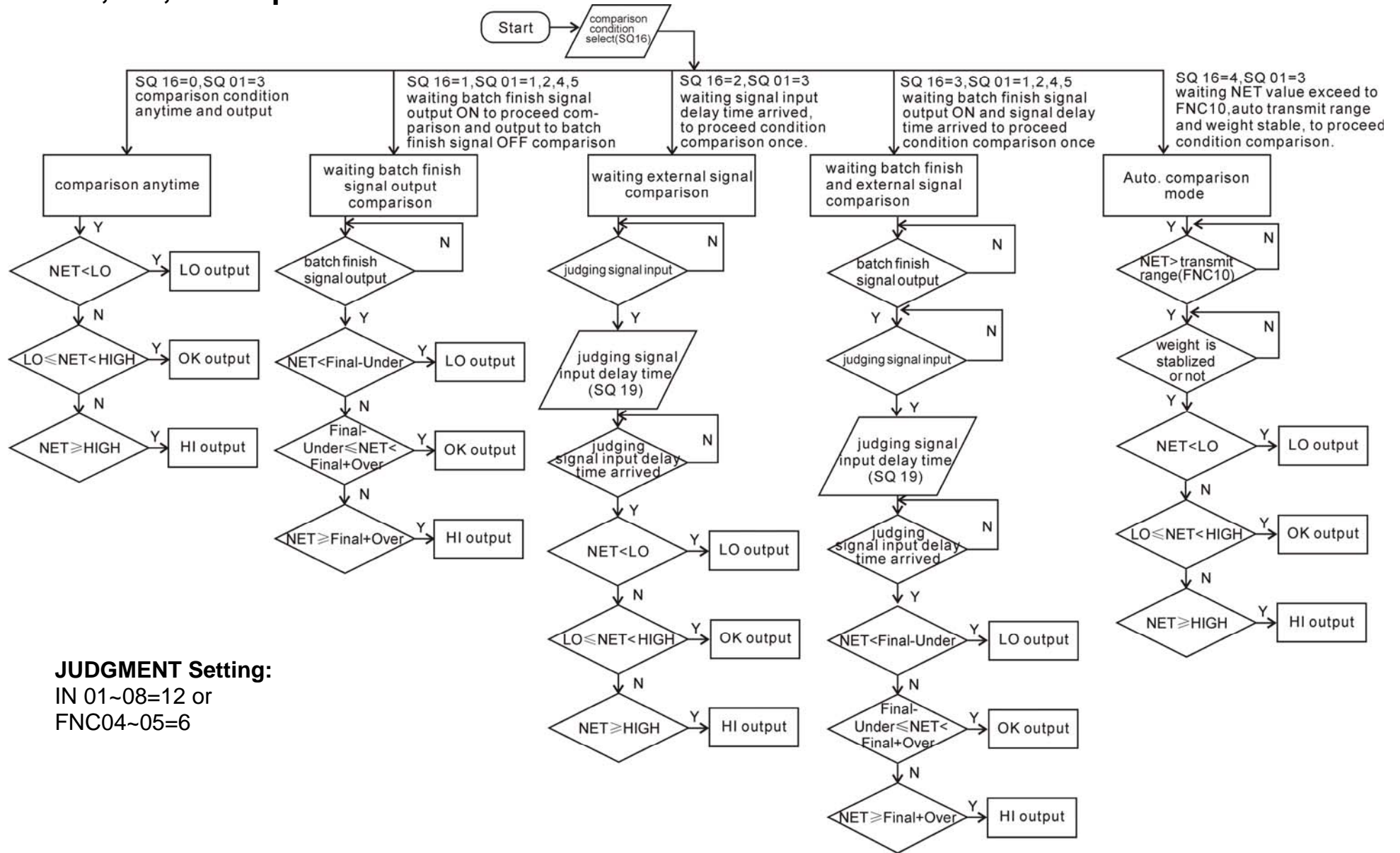


4-5 Loss-in Weight flow chart (SQ1=2)





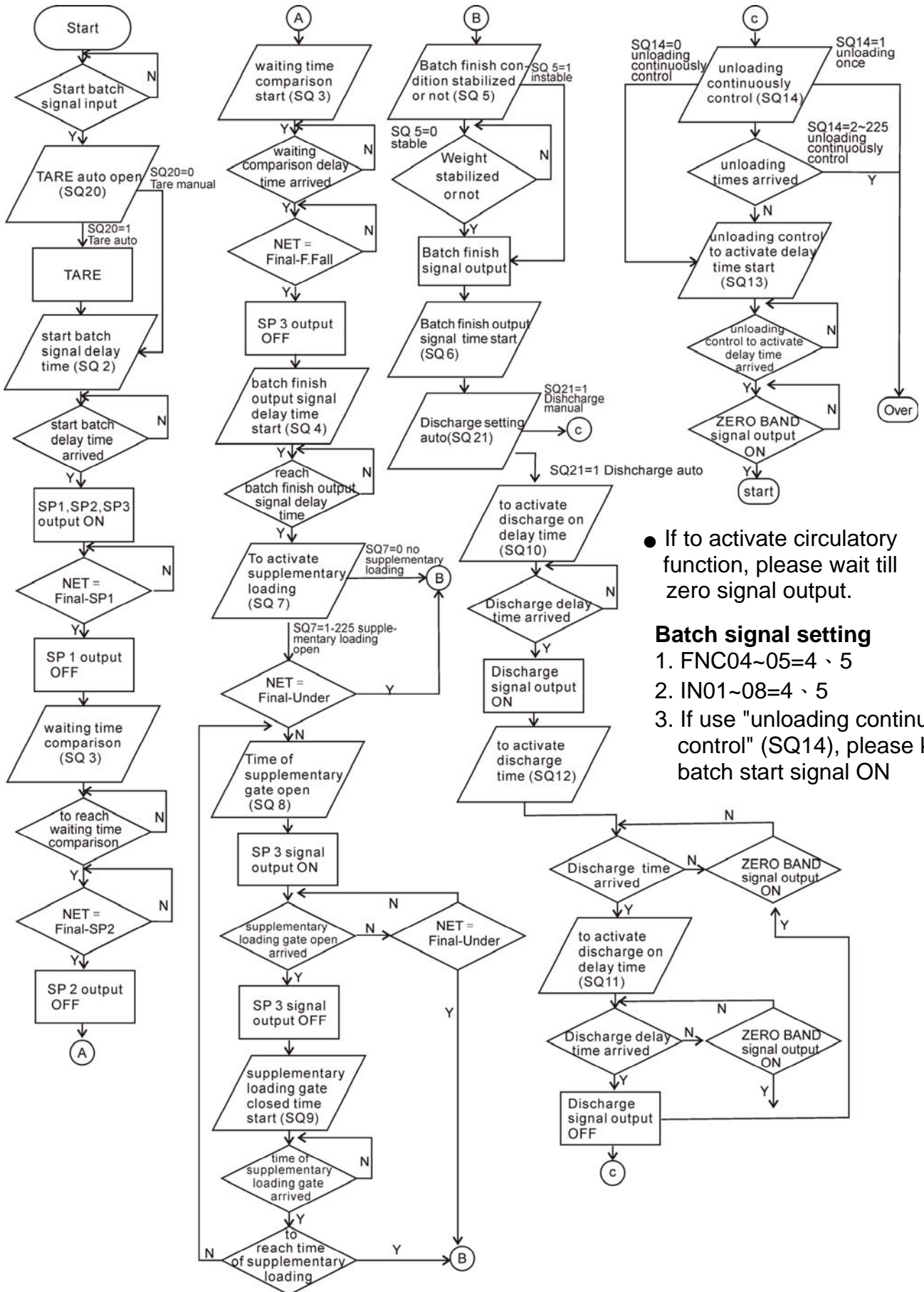
4-6 Hi, OK, Lo output flowchart



JUDGMENT Setting:
 IN 01~08=12 or
 FNC04~05=6



4-7 Normal batching (built-in program) flowchart (SQ-01=4)



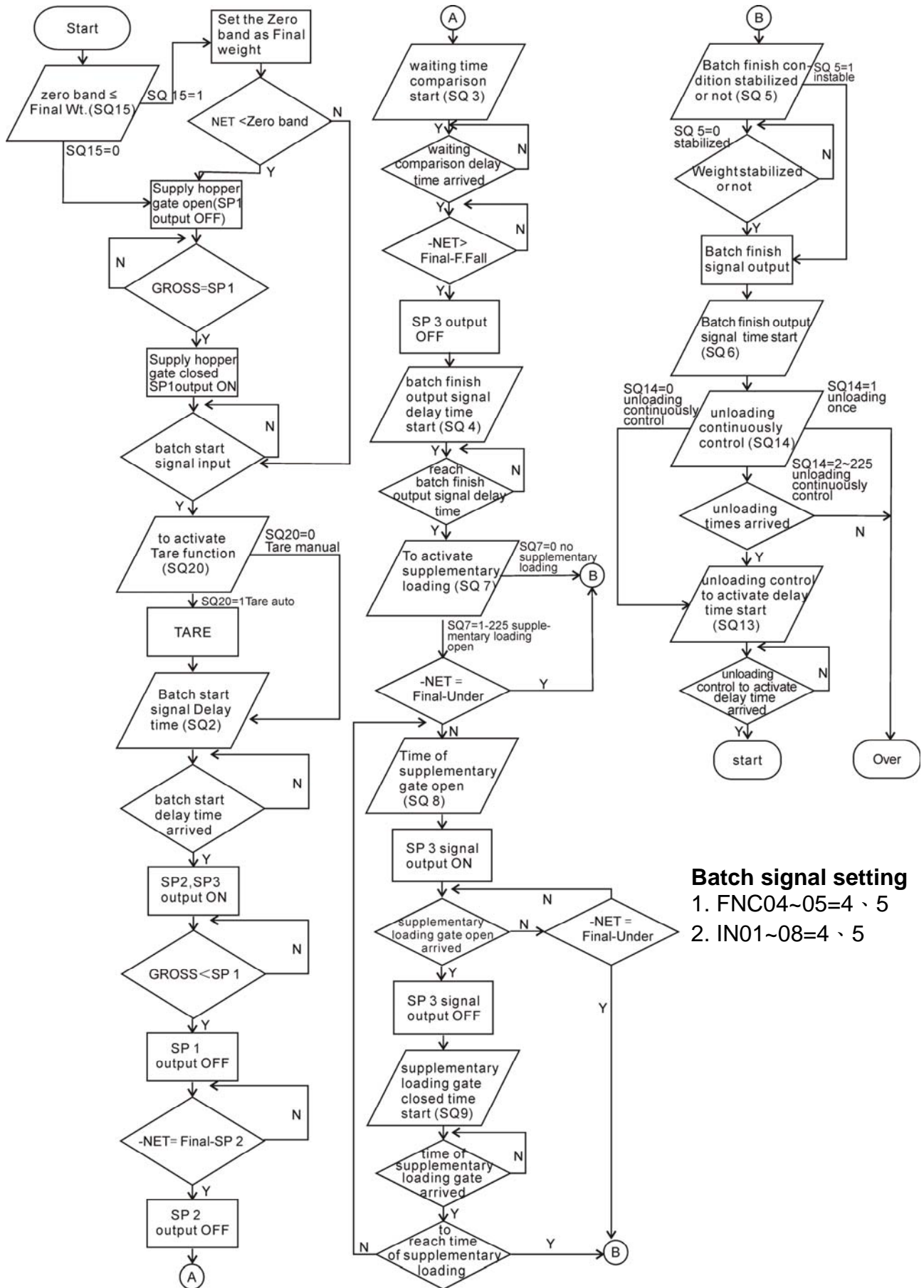
- If to activate circulatory function, please wait till zero signal output.

Batch signal setting

1. FNC04~05=4、5
2. IN01~08=4、5
3. If use "unloading continuously control" (SQ14), please keep batch start signal ON



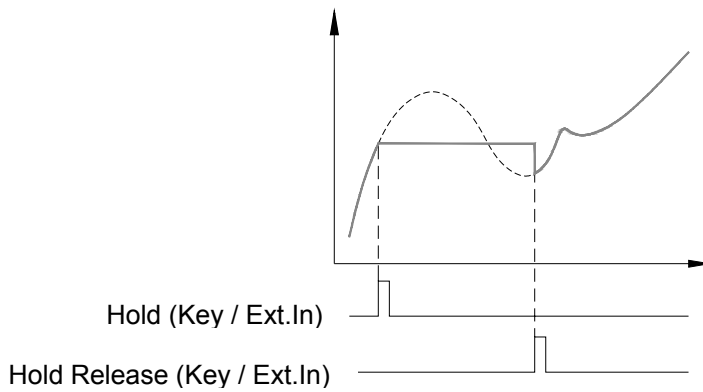
4-8 Loss-in Weight (built in program) (SQ-01=5)



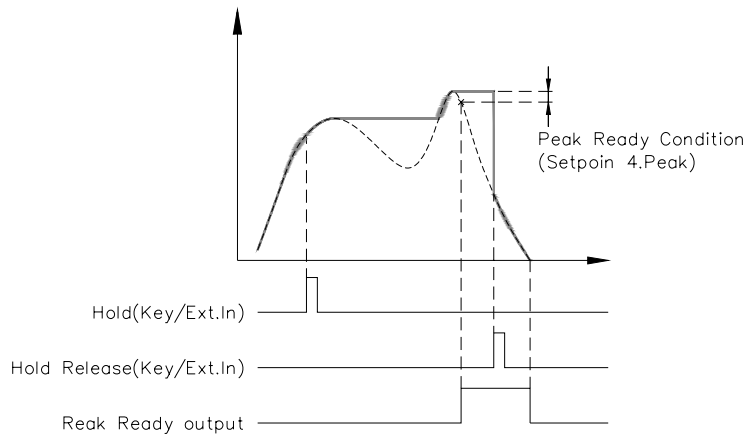


4-9 Hold mode (SQ-01 = 6)

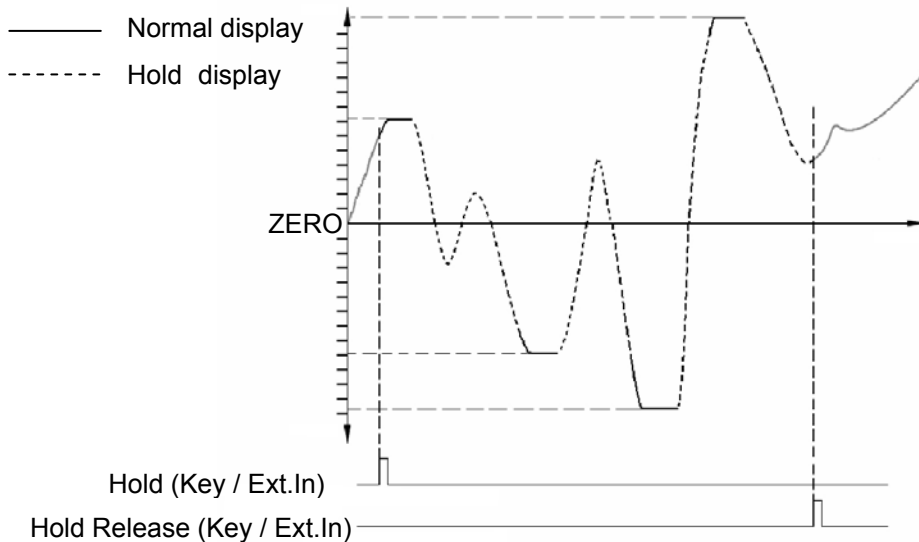
1. General hold mode (FNC-11 = 0)



2. Peak hold mode (FNC-11 = 1 、 2)



3. Peak hold mode (FNC-11 = 3 、 4)

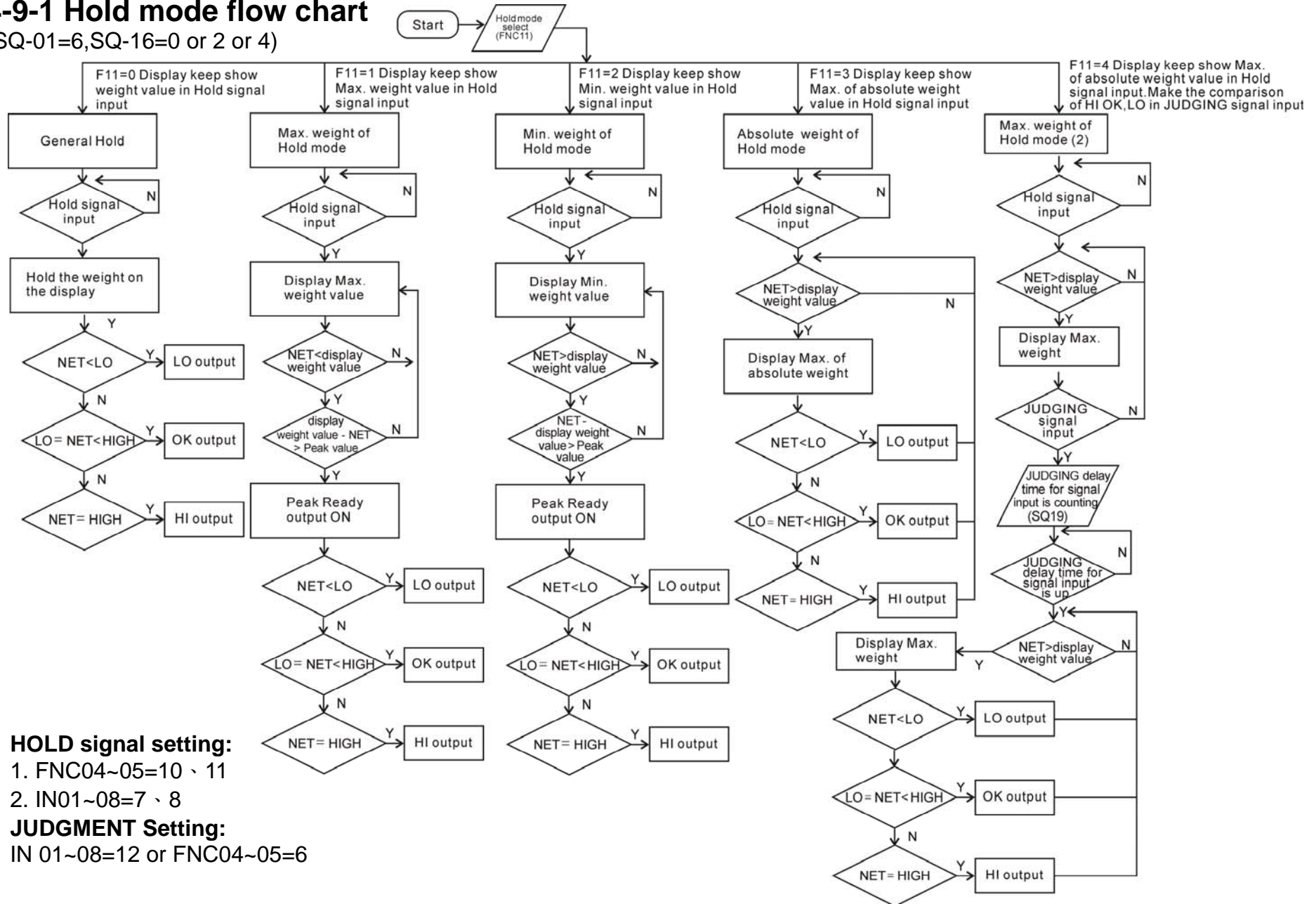


Peak hold mode with four different states (FNC-11 = 1,2,3,4), positive peak weight(1), negative peak weight, absolute value of peak weight and positive peak weight(2) . The peak holds of absolute value and positive peak weight (2) both have no peak ready signal output.



4-9-1 Hold mode flow chart

(SQ-01=6, SQ-16=0 or 2 or 4)





4-9-2 Hi, OK, Lo comparison

1. Normal HOLD (FNC-11 = 0)

Entering the Hold mode, Hi, OK, Lo comparison output. Escape Hold mode will switch off the outputs.

2. Peak HOLD (FNC-11 = 1, 2)

If Peak Ready is ON, Hi, OK, Lo comparison output. Escape Hold mode will switch off the outputs.

3. The absolute value of peak HOLD (FNC-11 = 3)

Entering the Hold mode, Hi, OK, Lo comparison output.

4. FNC-11 = 4

When the external input single Judgement is ON, Hi, OK, Lo comparison output.

5. If to release HOLD (display value and Hi, OK, Lo signal), please make HOLD release signal on.

4-10 Totalizing (ACCU.) Auto / Transmit

With automatic totalising active (SQ-17) or RS232 / RS485 or BCD output set to auto transmit.

1. SQ-01 = 1, 2, 4 or 5 batch / loss-in weight

- a) When the weight reaches the Final weight and the batch finish signal is ON the net weight will be added to the totaliser and number of additions is incremented. The RS-232 / RS-485 and BCD outputs transmit data. (RS-01/ RS-02=10 accumulated weight and counts)
- b) When the net weight returns to the zero range (FNC-10), then the sequence in a) above can be repeated.
- c) When SQ-01=1 or 4, Net >Final and Batch finish=1, it accumulate once.
- d) When SQ-01=2 or 5, -Net >Final and Batch finish=1, it accumulate once.

2. SQ-01 = 3 Comparison mode

- a) When the net weight exceeds the zero range and the weight has stabilized it will be added to the totaliser and number of additions is incremented. The RS-232 – RS-485 and BCD outputs transmit data.

3. SQ-01=6 HOLD mode

- a).Lo. Wt. <weight<Hi. Wt. weight will be added to the totaliser and number of additions is incremented. RS-232 / RS-485 and BCD outputs transmit data. (RS-01/ RS-02=10 accumulated weight and counts)
- b). Until the net weight returns to the zero range (FNC-10), then the sequence in a) above can be repeated.

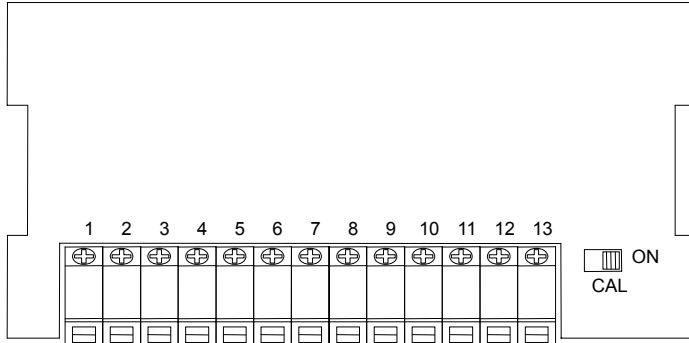


Chapter 5 Interface

5-1 Serial Input / Output Interface (default OP-01)

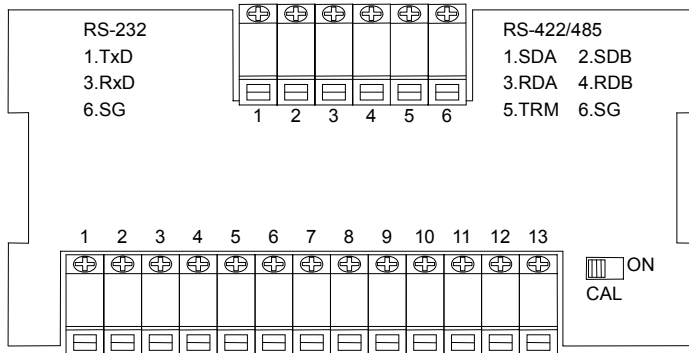
Pin location and setting

1. Default RS232 and Current-loop



PIN	Function
5	Current loop out
6	Current loop out
7	TXD
8	RXD
9	SG

2. OP-01 RS-422 / RS-485 / RS-232



RS-232

1.TxD

3.RxD

6.SG

RS-422/485

1.SDA 2.SDB

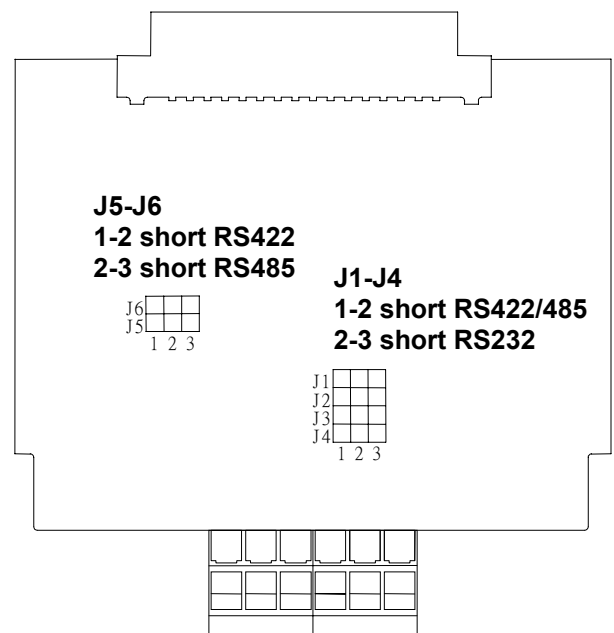
3.RDA 4.RDB

5.TRM 6.SG

PIN	Function	
	RS422/RS485	RS232
1	SDA	TXD
2	SDB	
3	RDA	RXD
4	RDB	
5	TRM	
6	SG	SG

Jumper configuration

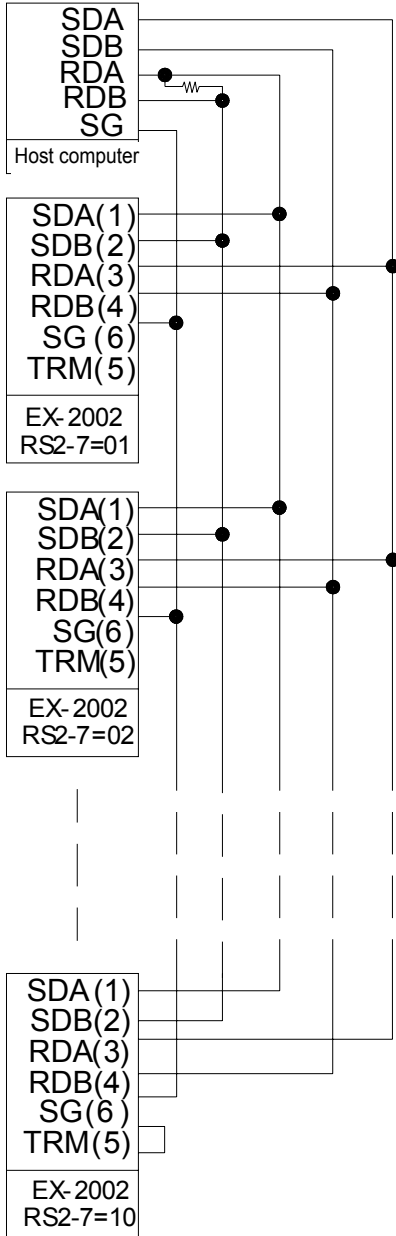
1. OP-01 RS422/RS485/RS232



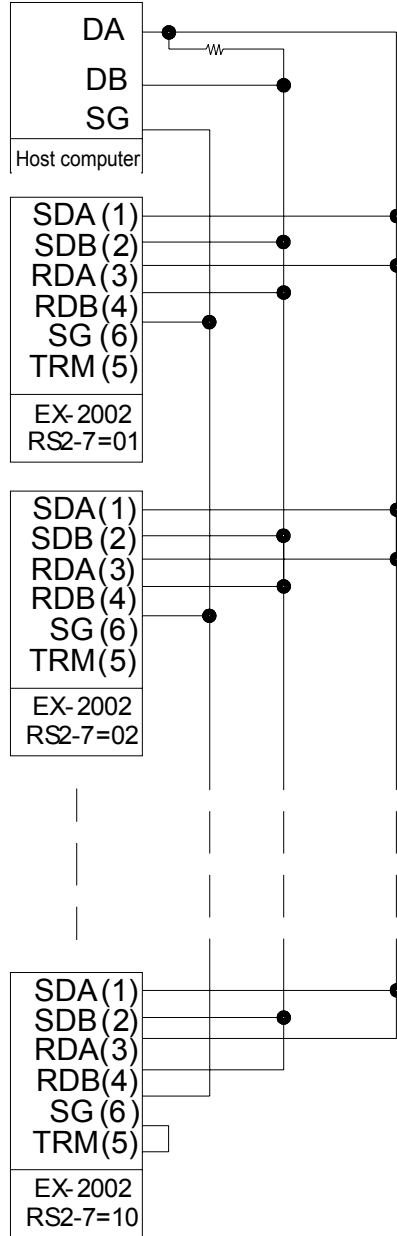


☞ Connection type

RS-422



RS-485



☞ Notice:

- The maximum connection is 10 sets of indicator.
- When the Host computer has the built-in terminal resist, it is not necessary to have the external one.
- On the last set of indicator, the TRM & RDB can be connected depends on the situation.
- When the host computer has no single (SG), it is acceptable to disconnect that part.



Function setting

First serial port interface 03 258

Setting procedure

03 258

Press the key

858800

Input desired
Parameter code

258800

Press the key

000000

Display shows the existing
parameter code. Input
a new code as required

Press the key

258805

Continue to the next function setting
or press key to escape

04 252

Press the key

04 252

852800

Input desired
Parameter code

252800

Press the key

000000

Display shows the existing
parameter code. Input
a new code as required

Press the key

252805

Continue to the next function
or press to escape

	⇒ Increment flashing digit
	⇒ Decrement flashing digit
	⇒ Move flashing point left
	⇒ Move flashing point right
	⇒ Store data in memory
	⇒ Exit / Escape



Item	Function	Setting value		Default	
		Parameter	Description		
RS1- 01 RS2- 01	Transmit format	0	As display	0	
		1	Gross only		
		2	Net only		
		3	As display (simple)		
		4	Gross (simple)		
		5	Net (simple)		
		6	Comparison + As display (simple)		
		7	Comparison +Gross (simple)		
		8	Comparison +Net (simple)		
		9	Tare		
		10	Totalised (Accu.) Weight and number of transactions		
RS1- 02 RS2- 02	Transmit mode	0	Transmit continuous + command mode	3	
		1	Auto transmit + command mode		
		2	Manual transmit + command mode		
		3	Command mode		
		4	MODBUS RTU mode		
RS1- 03 RS2- 03	Transmit speed	0	600	2	
		1	1200		
		2	2400		
		3	4800		
		4	9600		
		5	19200		
RS1- 04 RS2- 04	Parity Bit length Stop Bit	0	N, 8, 1	No parity, 8 data bits, 1 Stop bit	2
		1	O, 7, 1	Odd parity, 7 data bits, 1 Stop bit	
		2	E, 7, 1	Even parity, 7 data bits, 1 Stop bit	
	Parity Bit length Stop Bit	0	N, 8, 2	No parity, 8 data bits, 2 Stop bit	2
		1	O, 8, 1	Odd parity, 8 data bits, 1 Stop bit	
		2	E, 8, 1	Even parity, 8 data bits, 1 Stop bit	
RS1- 05 RS2- 05	Transmit times	0	Open	0	
		1	1 time/sec.		
		2	2 time/sec.		
		3	5 time/sec.		
		4	10 time/sec.		
RS1- 06 RS2- 06	Transmission conditions	<p>0 0 0 0 0 0</p> <p>0 ⇒ transmit cont. 1 ⇒ Stop transmit</p>		000000	
RS1- 07 RS2- 07	Indicator poling address	00 ↓ 99	When set to 0, Indicator addressing is not used	0	



☞ Data format

1. General Format

NET	S	T	,	G	S	,	+	0	1	2	3	4	5	6	k	g	CR	LF
GROSS	S	T	,	N	T	,	+	1	2	3	4	.	5	6		g		
TARE	S	T	,	T	R	,	+	0	1	2	3	4	5	6		t		
+ OL	O	L	,	G	S	,	+	SP	SP	SP	SP	SP	SP	SP	SP	SP		
- OL	O	L	,	G	S	,	-	SP	SP	SP	SP	SP	SP	SP	SP	SP		
UNSTABLE	U	S	,	G	S	,	+	1	2	3	4	.	5	6	k	g		

2. Totalised (Accu.) Format (RS1-01 / RS2-01=10)

Accu. Weight	T	W	,	+	1	2	3	4	5	6	.	7	8	9	k	g	CR	LF
Accu. Wt. Over+	T	W	,	+	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP		
Accu. Wt. Over -	T	W	,	-	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP		
Accu. Count	T	N	,	+	0	1	2	3	4	5	6	7	8	9				
Accu. Count over	T	N	,	+	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP				

3. Sample Format

Gross/Net or as display	+	1	2	3	4	5	6	CR	LF
Over load positive	+	SP	SP	SP	SP	SP	SP		
Over load negative	-	SP	SP	SP	SP	SP	SP		

4. Setpoint (1) + Simple Format (Gross/Net or as display)

	+	1	2	3	4	5	6	CR	LF								
<table border="1" style="width: 100%; text-align: center;"> <tr> <td>bit 7</td><td>bit 6</td><td>bit 5</td><td>bit 4</td><td>bit 3</td><td>bit 2</td><td>bit 1</td><td>bit 0</td> </tr> </table>								bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0		
bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0										

- bit 0 : Zero Band
- bit 1 : Over
- bit 2 : Under / Hi
- bit 3 : SP1 / OK
- bit 4 : SP2 / Lo
- bit 5 : SP3
- bit 6 : Discharge
- bit 7 : Batch finished



5. Comparison condition (2)

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
--------	--------	--------	--------	--------	--------	--------	--------

Byte 0 : Zero Band

Byte 1 : Over

Byte 2 : Under / Hi

Byte 3 : SP1 / OK

Byte 4 : SP2 / Lo

Byte 5 : SP3

Byte 6 : Discharge

Byte 7 : Batch finished

ON : 0 (ASC II Code 30 H)

OFF : 1 (ASC II Code 31 H)

Description

	Output	ASCII	Description
Status 1	OL	4FH, 4CH	Over load
	ST	53H, 54H	Weight stable
	US	55H, 53H	Weight unstable
Status 2	GS	47H, 53H	Gross Weight
	NT	45H, 54H	Net Weight
	TR	54H, 52H	TARE
	TW	54H, 57H	Totalised Weight
	TN	54H, 4EH	Number of transactions in total
Data of Weight	0 ~ 9	30H ~ 39H	Figure of weight
	+, -	2BH, 2DH	Symbol (+ or -) of weight
	Space	20H	Over load
	.	2EH	Decimal
Units	Space, Space	20H, 20H	None
	kg	6BH, 67H	kg
	Space t	20H, 74H	tonne
	lb	6CH, 62H	lb
Ending code	CR, LF	0DH, 0AH	Ending code
Separating code	,	2CH	Comma

**☒ Command mode****1. Command Format A**

Host	Command	<CR>< LF>		
Slave			Command	<CR>< LF>

MZ	Zero	CZ	Zero compensation On/OFF
MT	Tare	CT	Clear TARE value
MG	Gross Weight	MN	Net weight
AT	Accu. Current net weight and times plus 1		
ST	Deduct times of last accu. Value minus 1		
DT	Clear accu. Value and times		
BB	Start batching (one time)	HB	Load stop
BC	Start batching (continuous)		
BD	Start unload		
SC	Transmit continuous	SA	Auto transmit
SM	Manual transmit	SO	Command mode
%	Stop continuous transmission and enter the command mode		

Note : Since BC continuous weighing is completed, it must zero re-set the continuous weighing frequency by BB command.

2. Command Format B

Host	Command	<CR>< LF>		
Slave			Data	<CR>< LF>

RW	Read current weight	RT	Read TARE
RG	Read Gross Weight	RN	Read Net weight
RB	Read current display of wt (simple)	RH	Read Gross (simple)
RI	Read Net (simple)		
RJ	Read comparison situation + current display of weight (simple)		
RK	Read comparison situation + Gross (simple)		
RL	Read comparison situation + Net (simple)		
RO	Read comparison situation (2)		
RF	Read prior completed weight	RA	Read accu. Value (incl. times)

Note : Prior command plus %

Read Weight Compared value: RS□□

FW	Read target item of unload value	S1	Read SP1
S2	Read SP2	S3	Read SP3
UD	Read Under	LO	Read LO
ZB	Read Zero Band	HI	Read HI
PR	Reading Peak value	OV	Read Over

Ex:

Command : RSFW< CR > < LF >

Indicator reply : RSFW□□□□□□

⏟
Finish 6 bytes



3. COMMAND FORMAT C

Host	Command + Data	<CR><LF>		
Slave			Command + Data	<CR><LF>

Write weight compared value WS□□XXXXXX
 XXXXXX : value (6 bytes) □□ : setting items

FW	Write target item of unload value	S1	Write SP1
S2	Write SP2	S3	Write SP3
UD	Write Under	LO	Write LO
ZB	Write Zero Band	HI	Write HI
PR	Write Peak value	OV	Write Over
BC	Write SQ14	PT	Set OUT

Note : WSPTxxxxxx (input 0~255 decimal system) converts to BIT value which indicates OUT (1-8) is ON, and the rest of numbers are OFF.

Ex:

Inputting WSPT000010 means the BIT value is 00001010 (OUT 2, 4 = ON) (OUT 1, 3, 5, 6, 7, 8 are OFF).

Error messages

- E1: Format command fault
- E2: Setting parameters over range
- E3: Command not recognised

Indicator poling address

If the indicator has an address configured in RS1 (2) – 07, it will only respond to messages prefixed with its address.

For example:

The indicator poling address is set to 02; it would send the weight value only if it received the command:

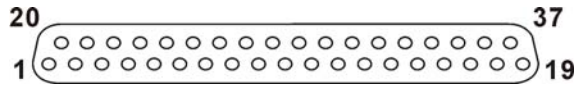
@02RW <CR> <LF>



5-2 BCD parallel output interface (OP-02)

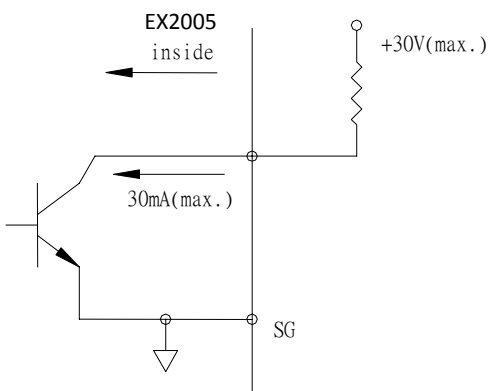
PIN Location

D-Sub 37PIN

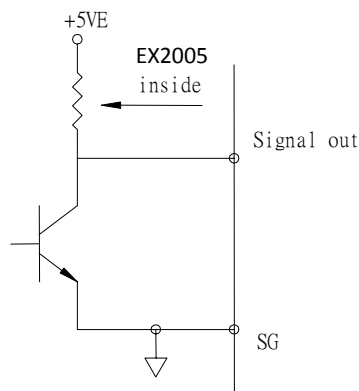


PIN	Function	PIN	Function
1	SG	20	SG
2	1×10^0	21	2×10^0
3	4×10^0	22	8×10^0
4	1×10^1	23	2×10^1
5	4×10^1	24	8×10^1
6	1×10^2	25	2×10^2
7	4×10^2	26	8×10^2
8	1×10^3	27	2×10^3
9	4×10^3	28	8×10^3
10	1×10^4	29	2×10^4
11	4×10^4	30	8×10^4
12	1×10^5	31	2×10^5
13	4×10^5	32	8×10^5
14	Gross / - Net	33	Stable / - MD
15	Plus / - Minus	34	DP1
16	DP2	35	DP3
17	DP4	36	Over / - Normal
18	Data ready	37	Hold input
19			

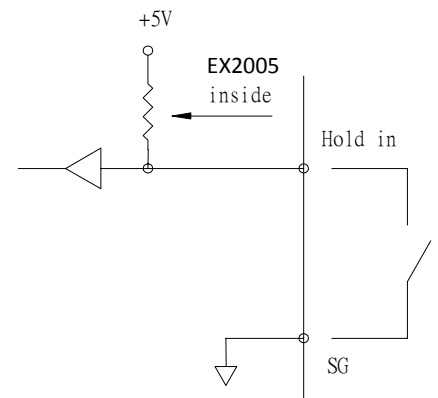
Equivalent Circuit



Open Collector Output (OP-02-1)



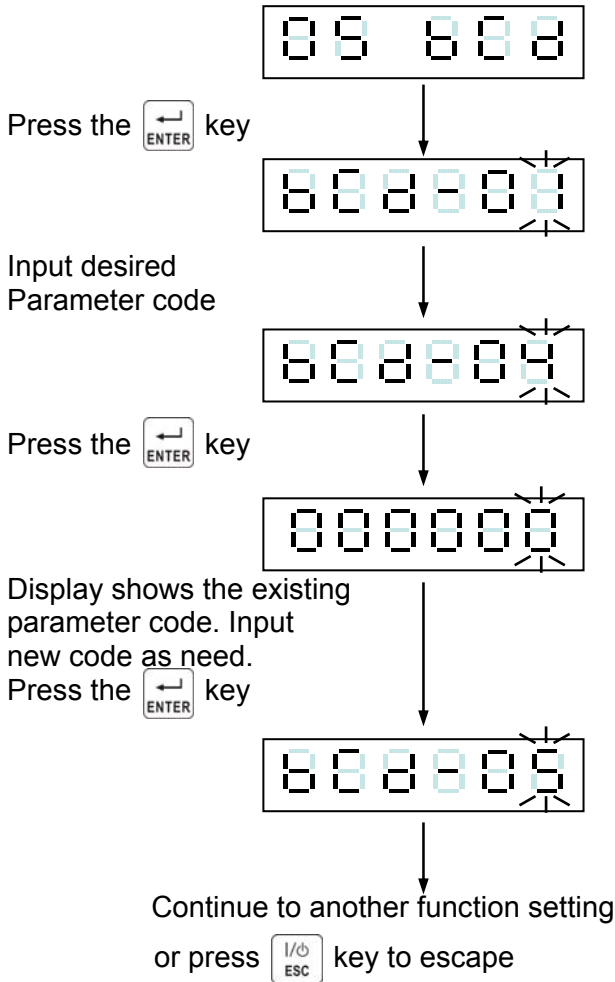
TTL Output (OP-02-2)



Hold Input



Function setting

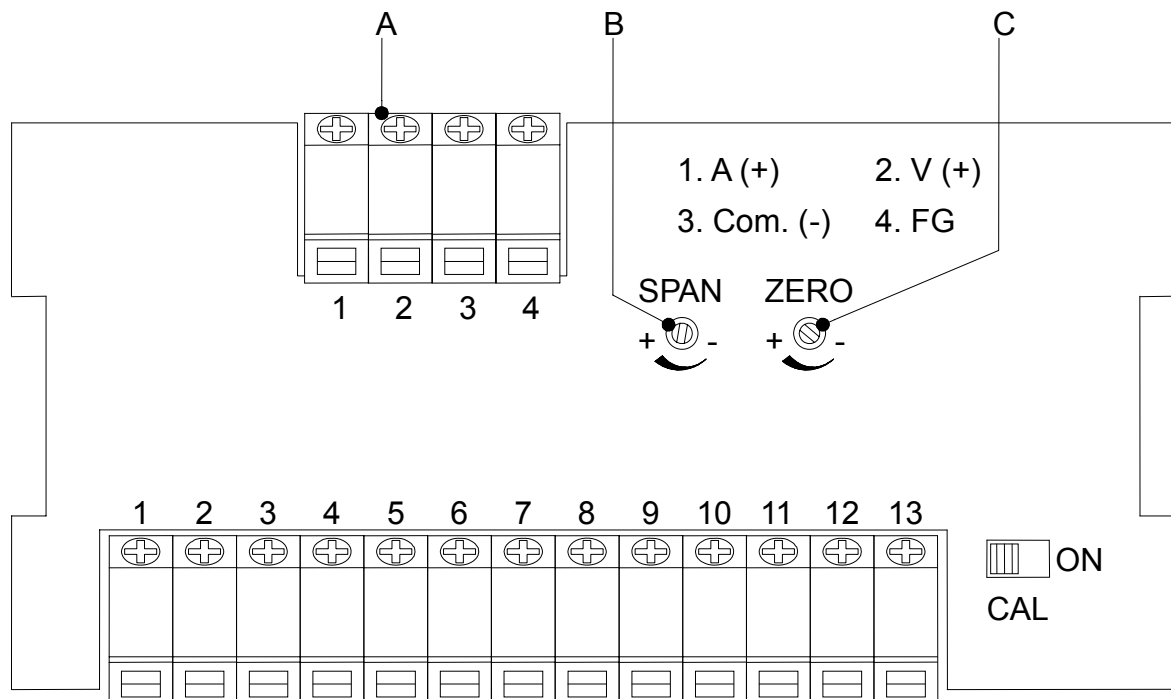


	⇒ Increment flashing digit
	⇒ Decrement flashing digit
	⇒ Move flashing point left
	⇒ Move flashing point right
	⇒ Store data in memory
	⇒ Exit / Escape

Item	Function	Setting value		Default
		Parameter	Description	
bCd- 01	Data type	0	As display	0
		1	Gross	
		2	Net	
bCd- 02	Transmit mode	0	Transmit continuous	0
		1	Auto transmit	
		2	Manual transmit	
bCd- 03	Output Logic	0	Positive logic action	0
		1	Negative logic action	
bCd- 04	Data ready Signal logic	0	Positive logic action	0
		1	Negative logic action	
bCd- 05	OL output code	0	FFFFFF	0
		1	999999	
bCd- 06	Data code	0	BCD Code	0
		1	Hex. Code	

5-3 Analogue Current / Voltage Output Interface (OP-03)

☞ Location



A. Terminal (4 way)

- 1 : 0 ~ 20mA current output, positive
- 2 : 0 ~ 10V voltage output, positive
- 3 : Current / voltage signal, negative
- 4 : Ground / 0V

B. SPAN adjustment

Current / voltage Span adjustment to increase value turn clockwise, decrease value turn anticlockwise.

C. ZERO adjustment

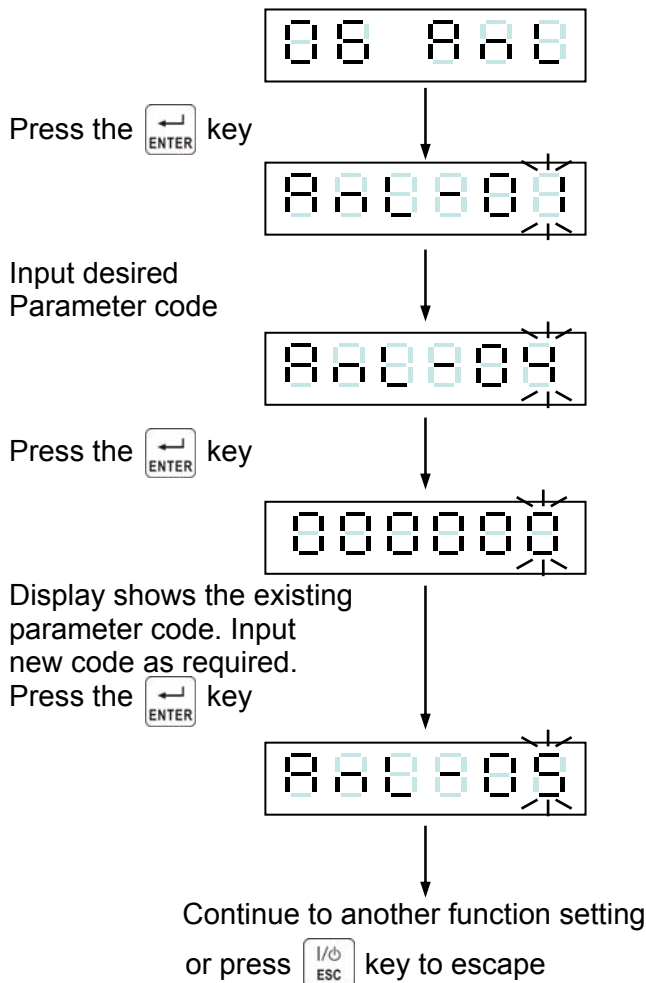
Current / voltage Zero adjustment to increase value turn clockwise, decrease value turn anticlockwise.

☞ Analogue output interface specification

- Resolution : 16 bits
- Current output : 0 ~ 20mA (0 ~ 550 Ω load)
- Voltage output : 0 ~ 10V



Function setting



- ⇒ Increment flashing digit
- ⇒ Decrement flashing digit
- ⇒ Move flashing point left
- ⇒ Move flashing point right
- ⇒ Store data in memory
- ⇒ Exit / Escape

Item	Function	Setting value		Default
		Parameter	Description	
AnL- 01	Data type	0	As display	0
		1	Gross	
		2	Net	
AnL- 02	Signal output	0	Current output	0
		1	Voltage output	
AnL- 03	Weight in Lo	000000 ~ 999999	When the weight reaches the value of that in AnL-03(the Max. weight is the max setting value (refer to CSP-04), the current / voltage(refer to AnL-02) output is changed to that configured in AnL-04	0
AnL- 04	Current / Voltage in Lo	0.0 mA ~ 20.0 mA or 0.0 V ~ 10.0 V		4.0
AnL- 05	Weight in Hi	000000 ~ 999999	When the weight reaches the value of that in AnL-05(the Max. weight is the max setting value (refer to CSP-04), the current / voltage(refer to AnL-02) output is changed to that configured in AnL-06	300000
AnL- 06	Current / Voltage in Hi	0.0 mA ~ 20.0 mA or 0.0 V ~ 10.0 V		20.0

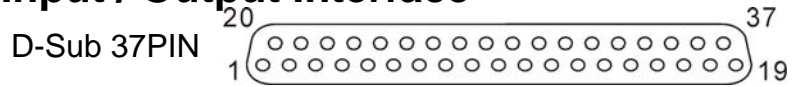


☞ Analogue output notes

1. The current output, load resistor should not exceed 550 Ω. It is recommended that a resistor with a low temperature coefficient and a power rating above 0.2 W be used.
2. Avoid short circuits between the positive and negative analogue output terminals as the interface this may cause damage.
3. It is recommended that a screened cable is used to connect the analogue output to its load and that the screen is earthed to avoid noise interference.

5-4 External Parallel Input / Output Interface

☞ PIN location



☞ OP-04 Control I/O (4 in / 4 out) + Setpoint Input (BCD code)

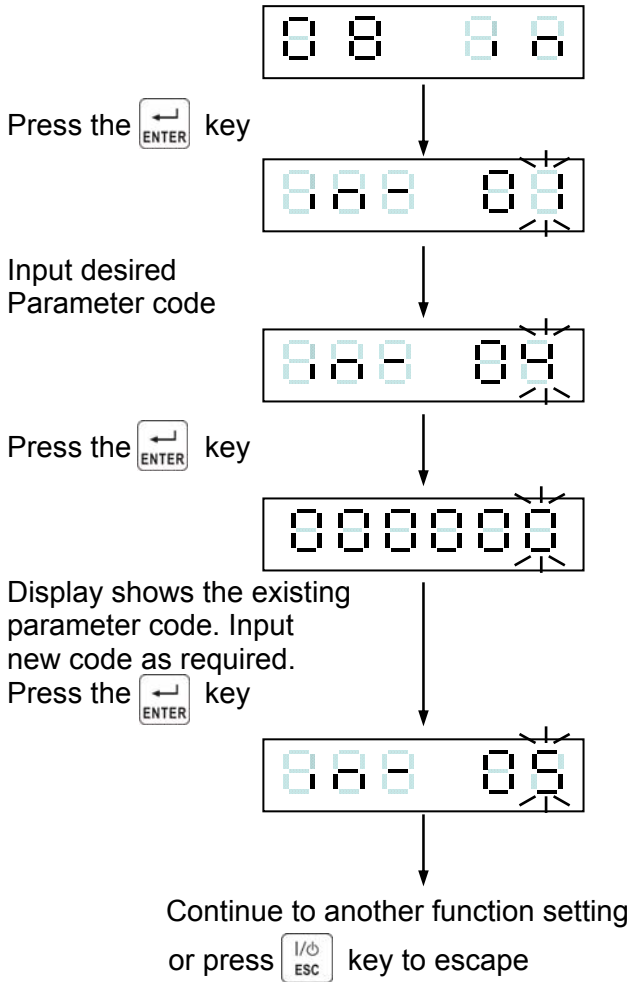
PIN	I/O	Signal	PIN	I/O	Signal
1	IN	Code 100	20	IN	Code 101
2	IN	Code 102	21	IN	Code 103
3	IN	Code 104	22	IN	Code 105
4	IN	Code 106	23	IN	Code 107
5	IN	Code 108	24	IN	Code 109
6	IN	Code 1010	25	IN	Code 1011
7			26		
8			27	OUT	OUT 1
9	OUT	OUT 2	28	OUT	OUT 3
10	OUT	OUT 4	29	IN	Vex
11		COM 2	30		COM 2
12			31		
13		COM 1	32		COM1
14	IN	IN 1	33	IN	IN 2
15	IN	IN 3	34	IN	IN 4
16			35		
17			36	IN	Code 1
18	IN	Code 2	37	IN	Code 4
19	IN	Code 8			

☞ OP-05 Control I/O (8 in / 8 out)

PIN	I/O	Signal	PIN	I/O	Signal
1	IN	IN 1	20		COM 1
2	IN	IN 2	21		COM 1
3	IN	IN 3	22		COM 1
4	IN	IN 4	23		COM 1
5	IN	IN 5	24		COM 1
6	IN	IN 6	25		COM 1
7	IN	IN 7	26		COM 1
8	IN	IN 8	27		COM 1
9		COM 1	28		COM 1
10		COM 2	29		COM 2
11	OUT	OUT 1	30		COM 2
12	OUT	OUT 2	31		COM 2
13	OUT	OUT 3	32		COM 2
14	OUT	OUT 4	33		COM 2
15	OUT	OUT 5	34		COM 2
16	OUT	OUT 6	35		COM 2
17	OUT	OUT 7	36		COM 2
18	OUT	OUT 8	37		COM 2
19	IN	Vex			



☞ Input signal configuration



	⇒ Increment flashing digit
	⇒ Decrement flashing digit
	⇒ Move flashing point left
	⇒ Move flashing point right
	⇒ Store data in memory
	⇒ Exit / Escape

Item	Function	Setting value		Default
		Parameter	⇒ Description	
IN - 01	Input 1	0	⇒ None	1
IN - 02	Input 2	1	⇒ Zero	2
IN - 03	Input 3	2	⇒ Tare	3
IN - 04	Input 4	3	⇒ Tare reset	4
IN - 05	Input 5	4	⇒ Start batching	5
IN - 06	Input 6	5	⇒ Stop batching	6
IN - 07	Input 7	6	⇒ Discharge Command	7
IN - 08	Input 8	7	⇒ Hold	8
		8	⇒ Hold display & I/O reset	
		9	⇒ Totalise (Accu) Command	
		10	⇒ Clear totaliser (Accu)	
		11	⇒ Clear previous total (Accu) Value	
		12	⇒ Start to compare	
		13	⇒ Serial and parallel printer manual output	
		14	⇒ Net / Gross	



Output signal setting

09 888

Press the key

888800

Input desired
Parameter code

888804

Press the key

000000

Display shows the existing
parameter code. Input
new code as required.
Press the key

888805

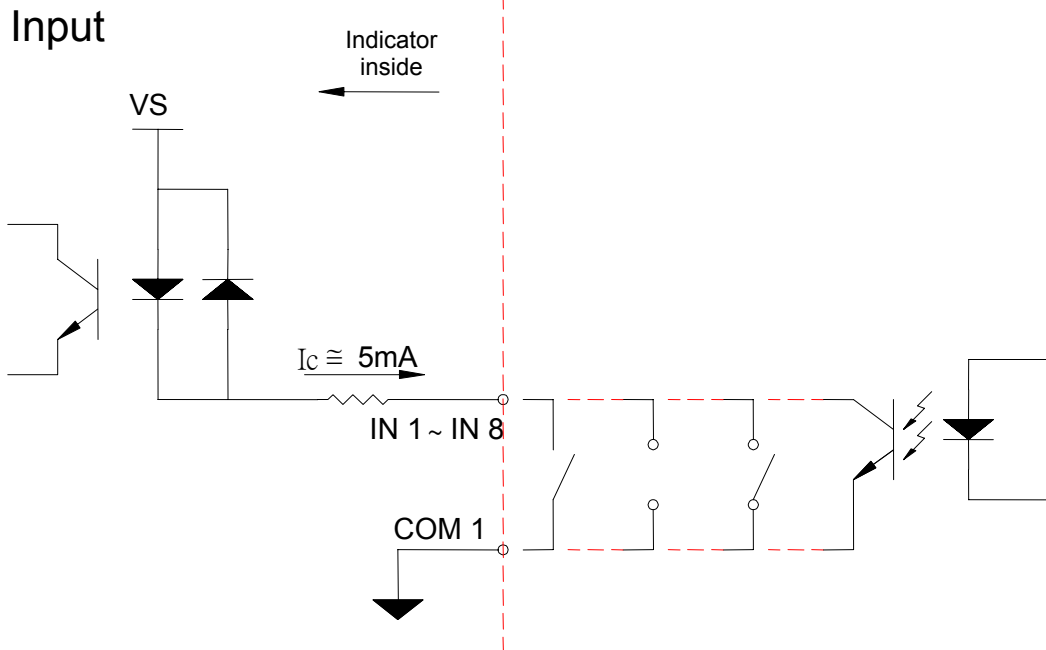
To continue another function setting
or press key to escape

	⇒ Increment flashing digit
	⇒ Decrement flashing digit
	⇒ Move flashing point left
	⇒ Move flashing point right
	⇒ Store data in memory
	⇒ Exit / Escape

Item	Function	Setting value		Default
		Parameter	Description	
OUT- 01	Output 1	0 ⇒ None	0000 → positive logic 1111 → negative logic	1
OUT- 02	Output 2	1 ⇒ Zero band		2
OUT- 03	Output 3	2 ⇒ SP1		3
OUT- 04	Output 4	3 ⇒ SP2		4
OUT- 05	Output 5	4 ⇒ SP3		5
OUT- 06	Output 6	5 ⇒ Batching completed		6
OUT- 07	Output 7	6 ⇒ Discharge		7
OUT- 08	Output 8	7 ⇒ Peak ready		8
		8 ⇒ Stable		
		9 ⇒ Internal batching process running		
		10 ⇒ Under		
		11 ⇒ Over		
		12 ⇒ Hi		
		13 ⇒ OK		
		14 ⇒ Lo		
OUT-09	The output logic of OUT-04~OUT-01			0000
OUT-10	The output logic of OUT-08~OUT-05			0000



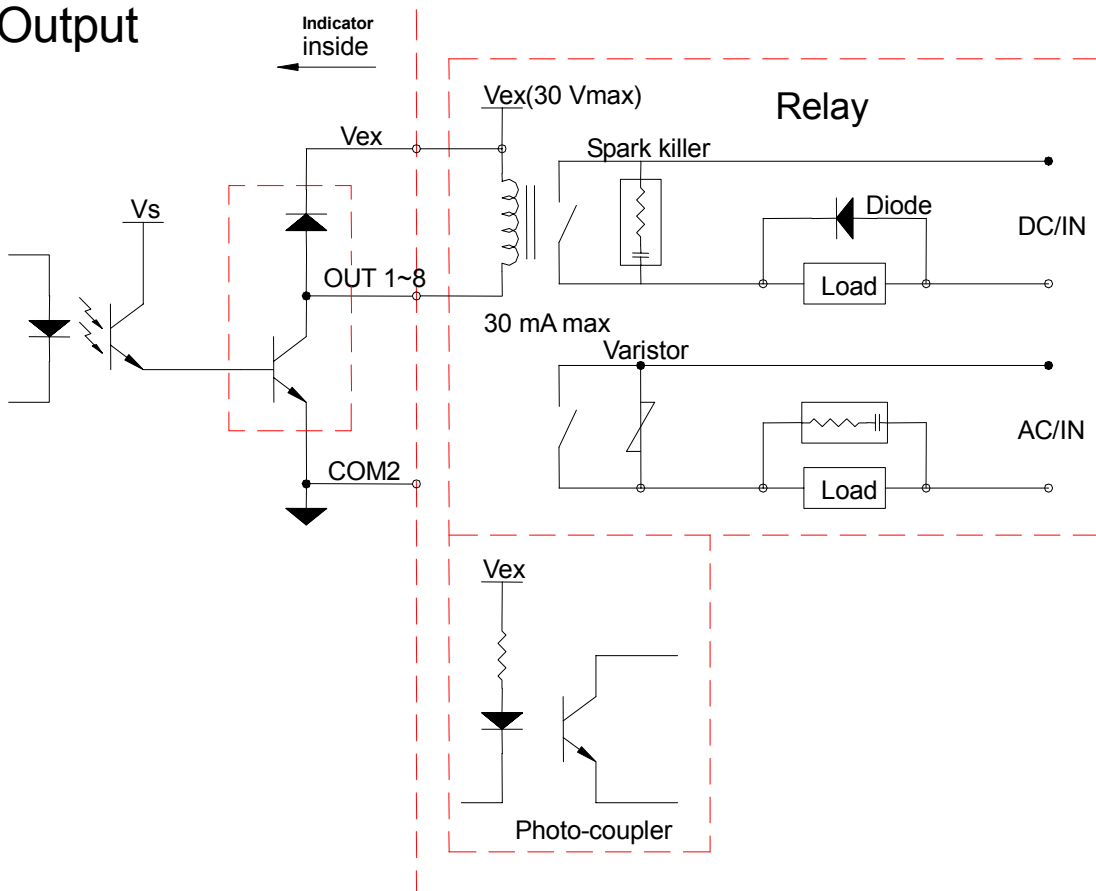
Equivalent Circuits



IN 1 ~ IN 8 and COM 1. Input signal - Open ↔ OFF, Short ↔ ON.

Warning: Don't use external power (AC or DC) to connect to the input terminals.

Output





☞ Thumbwheel Switches (for OP-04)

The interface can connect to external thumbwheel switches or a PLC to input various parameters depending on the configuration of SQ-01.

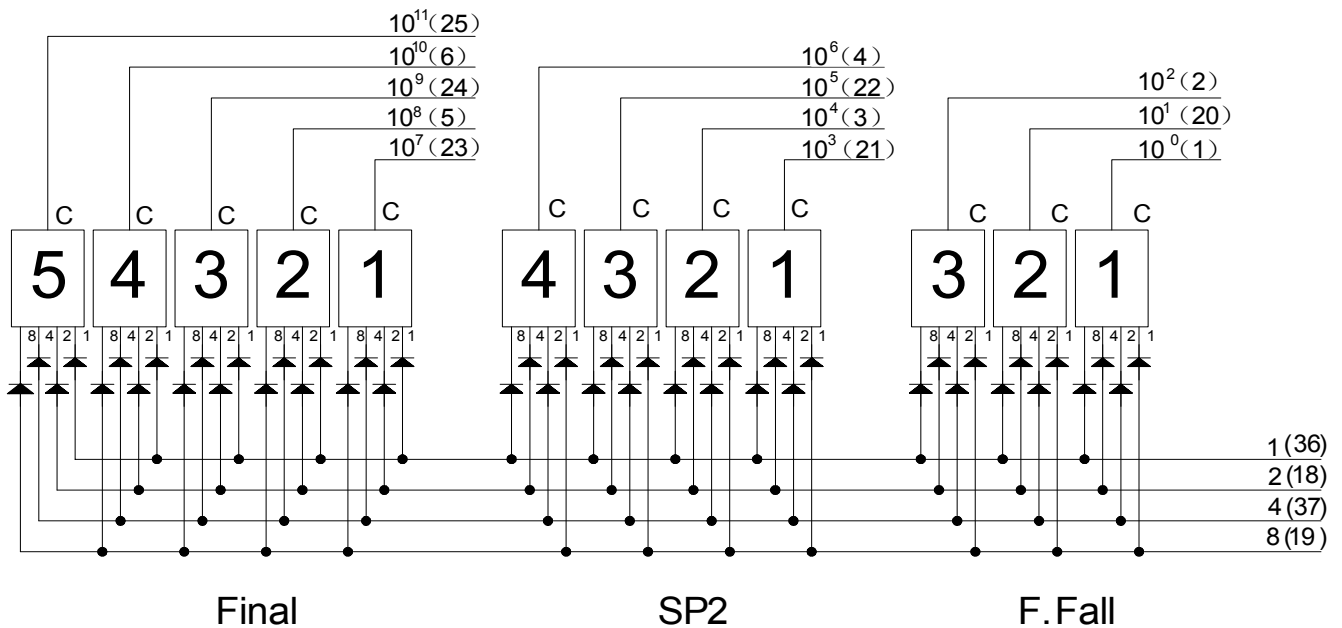
The input variables are:

- ① Final (5 digits), SP2 (4 digits) & Free Fall (3 digits).
- or ② Hi (6 digits), Lo (6 digits).

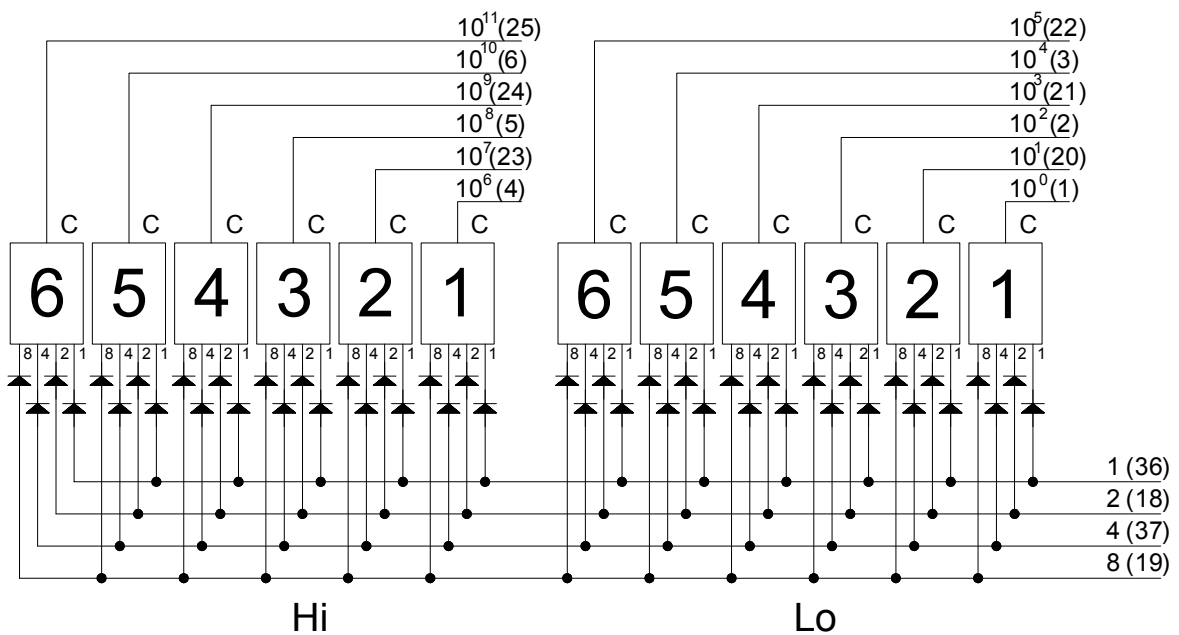
When using external thumbwheel Switches, SQ-18 should be set to 1.

Connection data

SQ-01 = 1, 2, 4 or 5



SQ-01 = 3 or 6





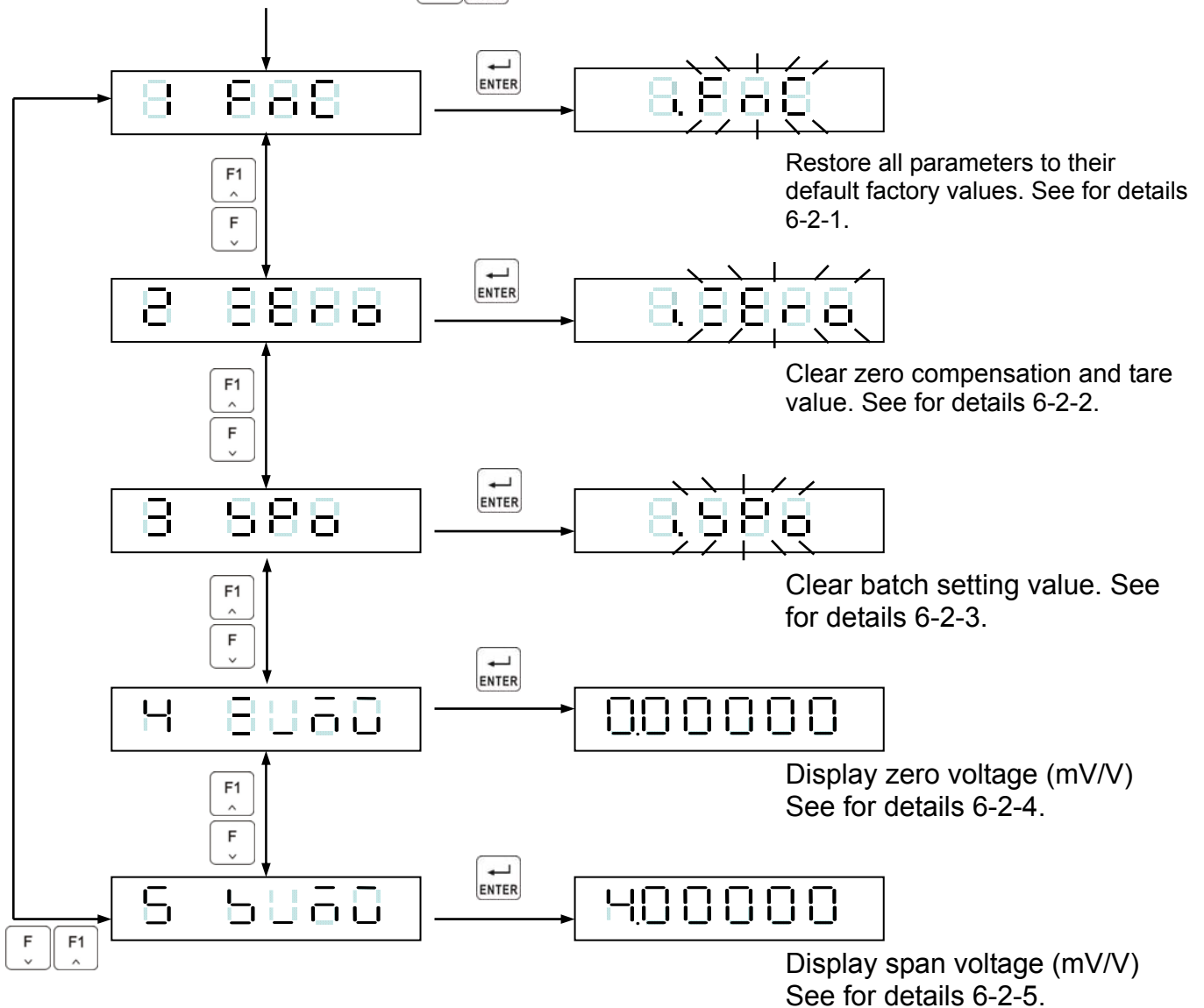
Chapter 6 Maintenance

6-1 Restore All Parameters to Their Default Factory Values.

- (1) While the indicator is counting back to zero, adjust SW to ON and press keys.
- (2) Display shows the flashing digits .
- (3) Confirm / abort.
 - (3-1) To confirm press the key & don't release it until the display shows , then release the key and return the calibration SW to OFF.
 - (3-2) To abort, set the calibration SW to OFF directly.

6-2 Maintenance Function Parameters

Power on the machine. Press keys while the display counts back to zero.





6-2-1 Restore the function parameter back to its default value

- (1) During the indicator count back to zero, press keys.
- (2) The display shows .
- (3) Press the key and the display shows flashing.
- (4) Confirm / abort.
 - (4-1) To confirm, press the key & don't release it. The display will then show .
 - (4-2) To abort press the key or switch the power off.

6-2-2 Clear zero compensation and TARE values

- (1) During the indicator count back to zero, press keys.
- (2) The display shows press the F1 key to display .
- (3) Press the key, the display shows flashing.
- (4) Confirm / abort.
 - (4-1) To confirm press the key & don't release it. The display will then show .
 - (4-2) To abort press the key or switch the power off.

6-2-3 Clear batch setting

- (1) During the indicator count back to zero, press keys.
- (2) The display shows press the F1 key to display .
- (3) Press the key, the display shows flashing.
- (4) Confirm / abort.
 - (4-1) To confirm press the key & don't release it. The display will then show .
 - (4-2) To abort press the key or switch the power off.

6-2-4 Display zero voltage (mV/V)

- (1) During the indicator count back to zero, press keys.
- (2) The display shows press the F1 key to display .
- (3) Press the key the display shows the zero voltage (mV/V). e.g .
- (4) Press the key or switch the power off.

6-2-5 Clear batch setting

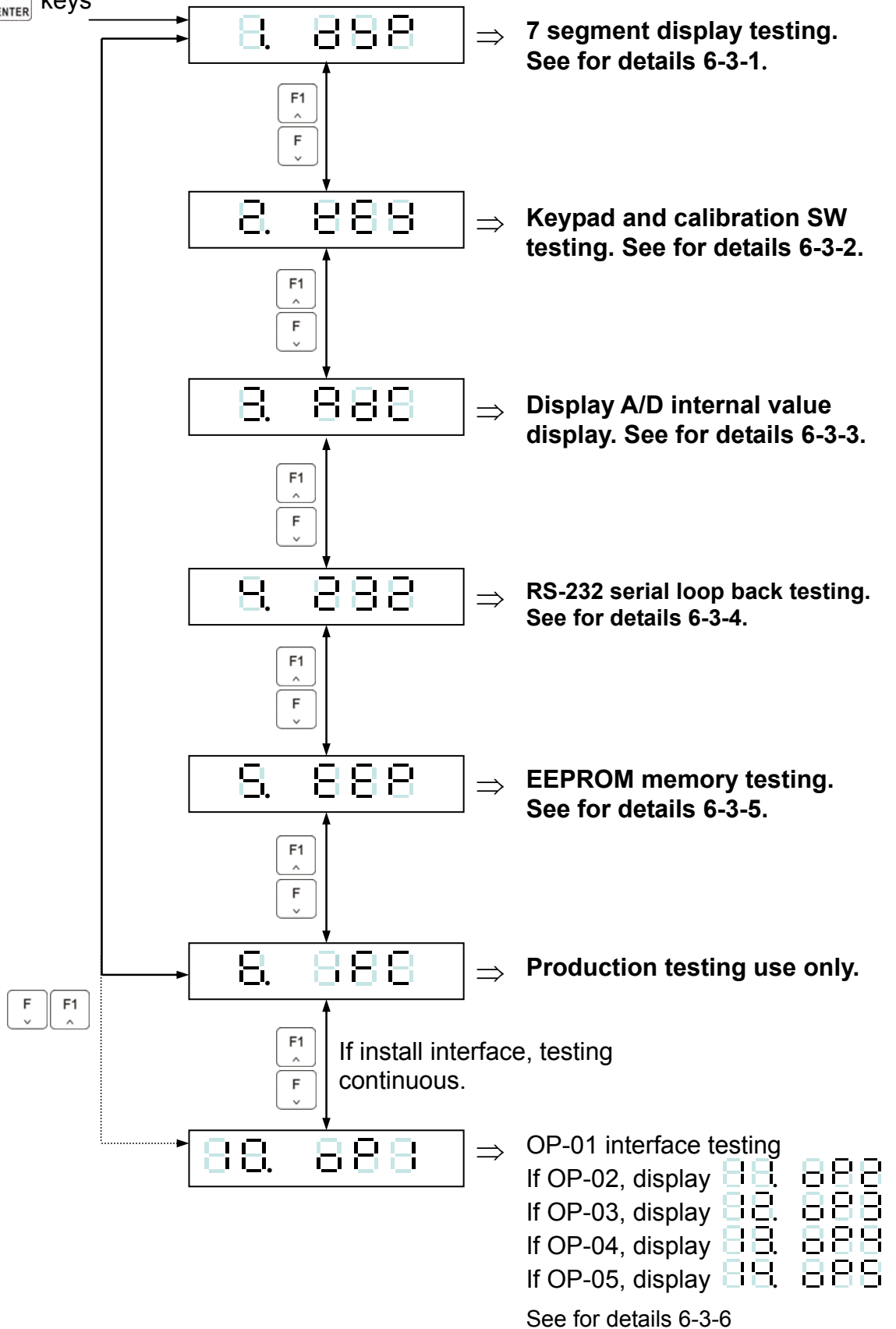
- (1) During the indicator count back to zero, press keys.
- (2) The display shows press the F1 key to display .
- (3) Press the key, the display shows the span voltage (mV/V). e.g. .
- (4) Press the key or switch the power off.



6-3 Test mode

During the indicator count back to zero

Press keys





6-3-1 7-Segment display testing

The display will show ~ , then display “.” and all of the icons.

To exit press the key

6-3-2 Keypad and calibration SW testing

Setting the calibration SW to “ON”, or pressing any key will cause the related display

segment to change from → . To exit press the key

6-3-3 Display A/D internal value display

Display range is 0 ~ 520,000d (-0.1mV/V ~ 4.0mV/V). To exit press the key

6-3-4 RS-232 serial loop back testing

Terminal pin 7 and pin 8 must be connected together at the rear of the indicator.

If display shows , the interface is working normally. If display shows ,

the interface is not working correctly.

6-3-5 EEPROM memory testing

If the display shows , it means normal. If the display shows , the memory is not working correctly.

6-3-6 Option interface card testing

OP-01 RS232/RS422/RS485 testing

1) RS232 testing

J1~J4 ⇒ 1, 2 short (Adjust J1~J4 mini jumper to 2, 3)

Terminal pin 1 and pin 3 must be connected together at the rear of the indicator.

If display shows , the interface is working normally. If display shows , the interface is not working correctly.

2) RS422 testing

J1~J4 ⇒ 1, 2 short (Adjust J1~J4 mini jumper to 1, 2)

J5~J6 ⇒ 1, 2 short (Adjust J5~J6 mini jumper to 1, 2)

Terminal pin1 and pin 3, pin 2 and pin 4 must be separately connected together at the rear of the indicator.

If display shows , the interface is working normally. If display shows , the interface is not working correctly.

OP-02 BCD parallel output interface testing

1) A flashing decimal point indicates the test procedure is active.

2) Program will transmit OFF → ON → OFF signal for each output bit of the BCD interface in sequence.

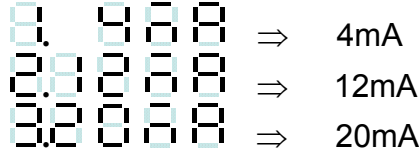


OP-03 Analogue current output interface testing

1) 4 ~ 20 mA current output testing

Use an ammeter to measure the output current between pin1 & pin 3 of the interface.

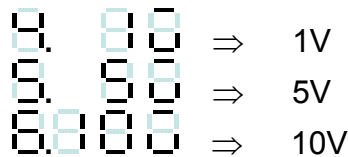
Use the keys to select the output current level desired.



2) 0 ~ 10V voltage output testing

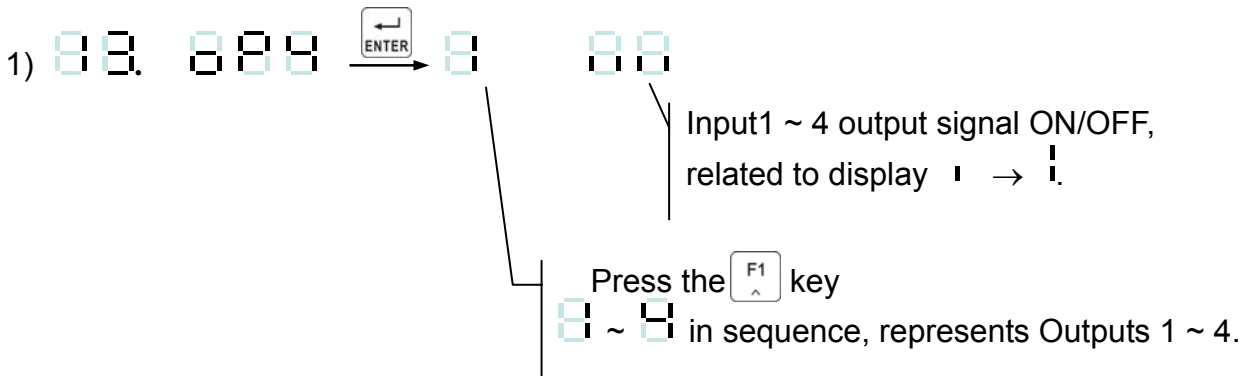
Use a voltmeter to measure the voltage between pin 2 & pin 3 of the interface.

Use the keys to select the output voltage level desired.



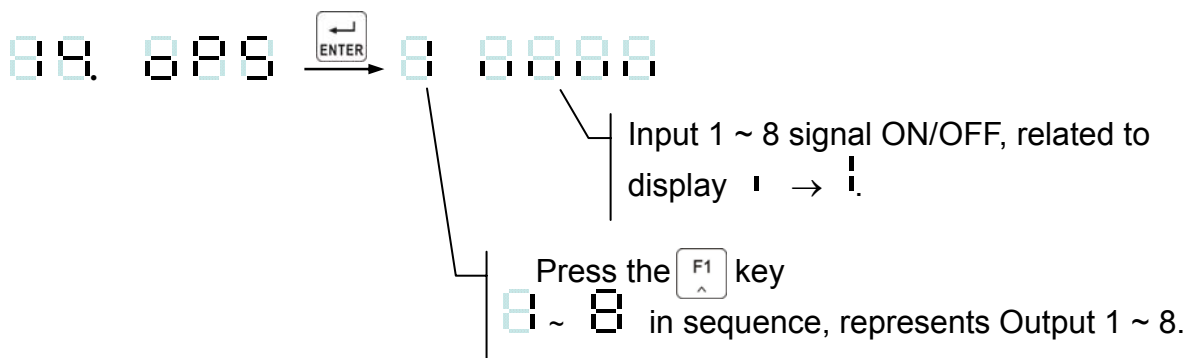
Warning: To avoid damage to components use only a voltmeter.

OP-04 Control I/O (4I/4O) testing



2) Press the key to switch to the control input value.

OP-05 Control I/O (8I/8O) testing





Appendix 1 Description of 7-Segment Characters

Digit	7 segments letter	Alphabet	7 segments letter	Alphabet	7 segments letter
0		A		N	
1		B		O	
2		C		P	
3		D		Q	
4		E		R	
5		F		S	
6		G		T	
7		H		U	
8		I		V	
9		J		W	
		K		X	
		L		Y	
		M		Z	



Appendix 2 Function Table

Specification Calibration

Item	Function	Setting value		Default
		Parameter	Description	
CSP-01	Unit	0	None	2
		1	g	
		2	Kg	
		3	t	
		4	lb	
CSP-02	Decimal Point	0	None	0
		1	1 Decimal Point	
		2	2 Decimal Point	
		3	3 Decimal Point	
CSP-03	Division	1	Division size	1
		2		
		5		
		10		
		20		
		50		
CSP-04	Max. Capacity	999999 ↓ 000000	Max. capacity	999999
CSP-05	Zero range	0 =full range (±1%~30%)	Zero range = calibration zero point ± (Max. capacity×setting value %)	0
CSP-06	Time of zero tracking	0.0 ~ 5.0 (sec)	Time and range of zero tracking should be use at the same time. If the time is set to 0.0, the zero tracking function is disabled	1.0
CSP-07	Range of zero tracking	0 ~ 9	Range of zero tracking = (setting value×½)D , D=min. division Range and time of zero tracking should be use at the same time. If the range is set to 0, the zero tracking function is disabled	2
CSP-08	Investigate time in stable	0.0 ~ 5.0 (sec)	Investigate time and range should be use at the same time. If the time is set to 0.0, the investigate time is disabled	1.0
CSP-09	Investigate range in stable	0 ~ 9	Investigate time and range should be use at the same time. If the range is set to 0, the investigate range is disabled	2
CSP-10	Weight unstable, function ZERO and TARE	0	Action	0
		1	None	
CSP-11	Gross Weight is negative, function TARE	0	Action	0
		1	None	



FNC Group Function Setting

Item	Function	Setting value			Default	
		Parameter	Description			
FNC-01	Digital Filter I	0	5 Hz		4	
		1	4.17 Hz			
		2	2.5 Hz			
		3	2.08 Hz			
		4	1.25 Hz			
		5	1.04 Hz			
		6	0.63 Hz			
		7	0.52 Hz			
		8	0.31 Hz			
		9	0.26 Hz			
FNC-02	Digital Filter II	0	Disabled		2	
		1	Less filter ↑ ↓ Greater			
		2				
		3				
		4				
		5				
FNC-03	Key – Locked	000000 ↓ 111111	0	Normal (lock disable)	The bits and front panel key positions are related to each other	000000
			1	Close (lock enable)		
FNC-04	“F” function setting	Parameter ⇒ Description 2 ⇒ Display Net / Gross weight 3 ⇒ Setpoint parameter setting 2 ⇒ Tare reset 3 ⇒ Manual serial, parallel print output 4 ⇒ Start load 5 ⇒ Stop load 6 ⇒ Start comparison 7 ⇒ Unload command 8 ⇒ Totalise weight and counts command			1	
FNC-05	“F1” function setting	9 ⇒ Clear totalised weight and counts 10 ⇒ Hold mode 11 ⇒ Escape Hold mode(I / O DSP) 12 ⇒ Convert to Gross / Net / totalised weight / totalised Count			0	



Item	Function	Setting value		Default
		Parameter	Description	
FNC-06	Front panel indication “◀” setting (top)	Parameter ⇒ Description		0
FNC-07	Front panel indication “◀” setting (next to top)	0 ⇒ Zero		
FNC-08	Front panel indication “◀” setting (next to bottom)	1 ⇒ MD		
FNC-09	Front panel indication “◀” setting (bottom)	2 ⇒ Gross		
		3 ⇒ Net		1
		4 ⇒ Totalised weight (Accu. V)		
		5 ⇒ Totalised transactions (Accu. C)		2
		6 ⇒ SP1		
		7 ⇒ SP2		3
		8 ⇒ SP3		
		9 ⇒ Hi		0
		10 ⇒ OK		
		11 ⇒ Lo		0
		12 ⇒ Under		
		13 ⇒ Over		0
		14 ⇒ Discharge		
		15 ⇒ Running		0
		16 ⇒ Hold		
FNC-10	Return to zero band (d: refer to CSP-03)	0	5 d	0
		1	10 d	
		2	20 d	
		3	40 d	
		4	60 d	
		5	80 d	
		6	100 d	
		7	150 d	
		8	200 d	
		9	250 d	
FNC-11	Hold	0	Hold	0
		1	Peak hold (positive 1)	
		2	Peak hold (negative)	
		3	Peak hold (absolute value)	
		4	Peak hold (positive 2)	
FNC-12	Rate for display rewrite	0	No limitation	0
		1	20 times/s	
		2	10 times/s	
		3	5 times/s	
		4	1 time/s	



Item	Function	Setting value		Default
		Parameter	Description	
FNC-13	Turn-on zero setting	0	Disable	0
		1	Enable	
FNC-14	Stand-by mode setting	0	Disable all the functions under stand-by mode	0
		1	Only turn off display but not disable other functions under stand-by mode	
FNC-15	Zero function record setting	0	Zero point record not saved into EEPROM	0
		1	Zero point record saved into EEPROM	



Serial Input/Output Interface (Build in OP-1)

Item	Function	Setting value		Default	
		Parameter	Description		
RS1- 01 RS2- 01	Transmit format	0	As display	0	
		1	Gross only		
		2	Net only		
		3	As display (simple)		
		4	Gross (simple)		
		5	Net (simple)		
		6	Comparison + As display (simple)		
		7	Comparison +Gross (simple)		
		8	Comparison +Net (simple)		
		9	Tare		
		10	Totalised (Accu.) Weight and number of transactions		
RS1- 02 RS2- 02	Transmit mode	0	Transmit continuous + command mode	3	
		1	Auto transmit + command mode		
		2	Manual transmit + command mode		
		3	Command mode		
		4	MODBUS RTU mode		
RS1- 03 RS2- 03	Transmit speed	0	600	2	
		1	1200		
		2	2400		
		3	4800		
		4	9600		
		5	19200		
RS1- 04 RS2- 04	Parity Bit length Stop Bit	0	N, 8, 1	No parity, 8 data bits, 1 Stop bit	2
		1	O, 7, 1	Odd parity, 7 data bits, 1 Stop bit	
		2	E, 7, 1	Even parity, 7 data bits, 1 Stop bit	
	For MODBUS:Parity Bit length Stop Bit	0	N, 8, 2	No parity, 8 data bits, 2 Stop bit	2
		1	O,8, 1	Odd parity, 8 data bits, 1 Stop bit	
		2	E, 8, 1	Even parity, 8 data bits, 1 Stop bit	
RS1- 05 RS2- 05	Transmit times	0	Open	0	
		1	1 time/sec.		
		2	2 time/sec.		
		3	5 time/sec.		
		4	10 time/sec.		
RS1- 06 RS2- 06	Transmission conditions	<p>0 0 0 0 0 0</p> <p>0 ⇒ transmit cont. 1 ⇒ Stop transmit</p>		000000	
RS1- 07 RS2- 07	Indicator poling address	00 ↓ 99	When set to 0, Indicator addressing is not used	0	

**BCD Parallel Output Interface (OP – 02)**

Item	Function	Setting value		Default
		Parameter	Description	
bCd- 01	Data type	0	As display	0
		1	Gross	
		2	Net	
bCd- 02	Transmit mode	0	Transmit continuous	0
		1	Auto transmit	
		2	Manual transmit	
bCd- 03	Output Logic	0	Positive logic action	0
		1	Negative logic action	
bCd- 04	Data ready Signal logic	0	Positive logic action	0
		1	Negative logic action	
bCd- 05	OL output code	0	FFFFFF	0
		1	999999	
bCd- 06	Data code	0	BCD Code	0
		1	Hex. Code	

Analogue Current/Voltage Output Interface (Op - 03)

Item	Function	Setting value		Default
		Parameter	Description	
AnL- 01	Data type	0	As display	0
		1	Gross	
		2	Net	
AnL- 02	Signal output	0	Current output	0
		1	Voltage output	
AnL- 03	Weight in Lo	000000 ~ 999999	When the weight reaches the value of that in AnL-03(the Max. weight is the max setting value (refer to CSP-04), the current / voltage(refer to AnL-02) output is changed to that configured in AnL-04	0
AnL- 04	Current / Voltage in Lo	0.0 mA ~ 20.0 mA or 0.0 V ~ 10.0 V		4.0
AnL- 05	Weight in Hi	000000 ~ 999999	When the weight reaches the value of that in AnL-05(the Max. weight is the max setting value (refer to CSP-04), the current / voltage(refer to AnL-02) output is changed to that configured in AnL-06	300000
AnL- 06	Current / Voltage in Hi	0.0 mA ~ 20.0 mA or 0.0 V ~ 10.0 V		20.0

**External Parallel Input/Output Interface (Op-04 & Op-05)****☐ OP-04 Control I/O (4 in / 4 out) + Setpoint Input (BCD code)**

PIN	I/O	Signal	PIN	I/O	Signal
1	IN	Code 100	20	IN	Code 101
2	IN	Code 102	21	IN	Code 103
3	IN	Code 104	22	IN	Code 105
4	IN	Code 106	23	IN	Code 107
5	IN	Code 108	24	IN	Code 109
6	IN	Code 1010	25	IN	Code 1011
7			26		
8			27	OUT	OUT 1
9	OUT	OUT 2	28	OUT	OUT 3
10	OUT	OUT 4	29	IN	Vex
11		COM 2	30		COM 2
12			31		
13		COM 1	32		COM1
14	IN	IN 1	33	IN	IN 2
15	IN	IN 3	34	IN	IN 4
16			35		
17			36	IN	Code 1
18	IN	Code 2	37	IN	Code 4
19	IN	Code 8			

☐ OP-05 Control I/O (8 in / 8 out)

PIN	I/O	Signal	PIN	I/O	Signal
1	IN	IN 1	20		COM 1
2	IN	IN 2	21		COM 1
3	IN	IN 3	22		COM 1
4	IN	IN 4	23		COM 1
5	IN	IN 5	24		COM 1
6	IN	IN 6	25		COM 1
7	IN	IN 7	26		COM 1
8	IN	IN 8	27		COM 1
9		COM 1	28		COM 1
10		COM 2	29		COM 2
11	OUT	OUT 1	30		COM 2
12	OUT	OUT 2	31		COM 2
13	OUT	OUT 3	32		COM 2
14	OUT	OUT 4	33		COM 2
15	OUT	OUT 5	34		COM 2
16	OUT	OUT 6	35		COM 2
17	OUT	OUT 7	36		COM 2
18	OUT	OUT 8	37		COM 2
19	IN	Vex			



Function Configuration Menu

Item	Function	Setting value		Default
		Parameter	Description	
SQ- 01	Batching mode	1	Normal batch	1
		2	Loss-in weight	
		3	Comparison mode	
		4	Normal batch (Built-in program)	
		5	Loss-in weight (Built-in program)	
		6	Hold mode (Built-in program)	
SQ- 02	Batching start delay time	0.0 ~ 25.5 (sec)	The built-in auto-program starts the batch comparison procedure after the input of the batch start signal	0.0
SQ- 03	SP1,SP2 Waiting time comparison	0.0 ~ 25.5 (sec)	No full flow comparison during this function's set time period. If the set value is 0, indicates this function is not in use	0.0
SQ- 04	Batch finish output signal delay time	0.0 ~ 25.5 (sec)	Output the batch finished signal after this delay time	0.5
SQ- 05	Batch finish Condition	0	Wait until the weight is stabilized	0
		1	No need to wait until the weight has stabilized	
SQ- 06	Batch finish Output signal time	0.0 ~ 25.5 (sec)	Batch finished output signal time. If set to 0, the output signal will be off until the next batch start	1.0
<p>Batch finish signal</p> <p>ON OFF</p> <p>Batch finish</p>				
SQ- 07	Number of Times the supplementary loading function operates	0 ~ 255	If the set value is 0, this function is not in use	0
SQ- 08	Supplementary loading gate open time	0.0 ~ 25.5 (sec)	Must be coordinate with times of supplementary loading, (SQ- 07)	0.1
SQ- 09	Supplementary loading gate close time	0.0 ~ 25.5 (sec)	Must be coordinate with times of supplementary loading, (SQ- 07)	1.0
<p>Supplementary loading signal</p> <p>ON OFF</p> <p>SQ- 07 Times of "ON" of the supplementary loading</p>				



Item	Function	Setting value		Default
		Parameter	Description	
SQ- 10	Discharge start delay time	0.0 ~ 25.5 (sec)	Delay time before Discharge signal is ON	0.0
SQ- 11	Discharge stop delay time	0.0 ~ 25.5 (sec)	Delay time before Discharge signal is OFF	0.0
SQ- 12	Discharge time	0.0 ~ 25.5 (sec)	Won't activate internal discharge control function, if set to 0	0
<p>The diagram illustrates the timing of the discharge signal. The top trace is the 'Discharge input signal', which is a rectangular pulse. The bottom trace is the 'Discharge output signal', which is a rectangular pulse that starts after a delay from the input signal, labeled 'SQ-10'. The output pulse ends after a delay from the start of the pulse, labeled 'SQ-11'. A vertical dashed line indicates the 'Weight reach zero band'.</p>				
SQ- 13	Restart delay time	0.0 ~ 25.5 (sec)	Delay time before Restart signal is ON	1.0
SQ- 14	Batching counts	0 ~ 255 (times)	Number of batch runs 0 ⇒ one batch only	0
SQ- 15	Set the zero band in to final weighing value	0	No setting	0
		1	Setting	
SQ- 16	Hi, OK, Lo	0	Comparison anytime	0
		1	To compare at batch finish	
		2	To compare at external input signal	
		3	To compare at batching finish and external input signal	
		4	Comparison auto	
SQ- 17	Auto totalise weight / counts	0	Disabled	0
		1	Enabled	
SQ- 18	The parameter source in weight comparison	0	Key in directly from front keypad	0
		1	Input directly from rear interface	
SQ- 19	Weight comparison delay time	0.0 ~ 25.5 (sec)	Comparison delay time for Hi, OK, Lo	0.5
SQ- 20	TARE auto.	0	Press keypad TARE to TARE	0
		1	TARE auto	
SQ- 21	Discharge auto	0	Input from external input or keypad	0
		1	Discharge auto + manual	



Appendix 3 MODBUS Data Address Table I

Data Register		Bit I/O		Bit I/O	
Function Code 03 (Read)		Function Code 01 (Read)		Function Code 05 and 15 (Write)	
Modbus	SCALE	Modbus	SCALE Output	Modbus	SCALE Input
40000 ~ 40001	As display value	00000	Stable status	01000	Zero
40002 ~ 40003	Gross weight	00001	Zero status	01001	Clear zero compensation
40004 ~ 40005	Net weight	00002	Gross	01002	Tare
40006 ~ 40007	Tare weight	00003	Net	01003	Clear Tare
40008 ~ 40009	Gross weight hold value			01004	Clear Pre-tare
40010 ~ 40011	Net weight hold value	00050	Zero Band	01005	Display the gross weight on main display
40012 ~ 40013	Weight final value	00051	Sp1	01006	Display the net weight on main display
40014 ~ 40015	Unit weight	00052	Sp2	01007	Enter/Exit the function mode
40016 ~ 40017	Percentage value	00053	Sp3	01008 ~ 01027	Switch unit from the 1 st to 20 th
40018 ~ 40019	Totalised value	00054	Batch Finish		
40020 ~ 40021	Totalised times	00055	Under	01049	Switch the operation modes
40022 ~ 40023	Totalised times of HI value	00056	Over	01050	Totalised the current net weight and add 1 to the totalised times
40024 ~ 40025	Totalised times of Lo value	00057	Unloading	01051	Deduct the last totalised value and deduct 1 to the totalised times
40026 ~ 40027	Totalised times of OK value	00058	Hi-Hi	01052	Clear the totalised value and times
		00059	Hi	01053	Running
Function Code 06 and 16 (Write)		00060	Go	01054	Stop
41000 ~ 41001	Pre-tare value	00061	Lo	01055	Discharge starts
41002 ~ 41003	Zero Band value	00062	Lo-Lo	01056	Hold mode ON/OFF
41004 ~ 41005	Target value	00063	Peak ready	01057	Release "Hold value"
41006 ~ 41007	SP1 value	00064	Running	01058	Output judgement
41008 ~ 41009	SP2 value	00065	ZERO calibration	01059	ZERO calibration
41010 ~ 41011	SP3 value	00066	SPAN calibration	01060	SPAN calibration
41012 ~ 41013	LO_LO value	00067	Calibrate ERR0		
41014 ~ 41015	LO value	00068	Calibrate ERR2		
41016 ~ 41017	HI_HI value	00069	Calibrate ERR6		
41018 ~ 41019	HI value				
41020 ~ 41021	Under value				
41022 ~ 41023	Over value				
41024 ~ 41025	Peak value setting				
41026 ~ 41027	Batch Finish delay time				
41100 ~ 41101	SPAN calibration value				



Appendix 4 MODBUS Data Address Table II

(For Hitech and Pro-face Human Machine Interface)

Data Register		Bit I/O		Bit I/O	
Function Code 03 (Read)		Function Code 01 (Read)		Function Code 05 and 15 (Write)	
Modbus	SCALE	Modbus	SCALE Output	Modbus	SCALE Input
40001 ~ 40002	As display value	00001	Stable status	01001	Zero
40003 ~ 40004	Gross weight	00002	Zero status	01002	Clear zero compensation
40005 ~ 40006	Net weight	00003	Gross	01003	Tare
40007 ~ 40008	Tare weight	00004	Net	01004	Clear Tare
40009 ~ 40010	Gross weight hold value			01005	Clear Pre-tare
40011 ~ 40012	Net weight hold value	00051	Zero Band	01006	Display the gross weight on main display
40013 ~ 40014	Weight final value	00052	Sp1	01007	Display the net weight on main display
40015 ~ 40016	Unit weight	00053	Sp2	01008	Enter/Exit the function mode
40017 ~ 40018	Percentage value	00054	Sp3	01009 ~ 01028	Switch unit from the 1 st to 20 th
40019 ~ 40020	Totalised value	00055	Batch Finish		
40021 ~ 40022	Totalised times	00056	Under	01050	Switch the operation modes
40023 ~ 40024	Totalised times of HI value	00057	Over	01051	Totalised the current net weight and add 1 to the totalised times
40025 ~ 40026	Totalised times of Lo value	00058	Unloading	01052	Deduct the last totalised value and deduct 1 to the totalised times
40027 ~ 40028	Totalised times of OK value	00059	Hi-Hi	01053	Clear the totalised value and times
		00060	Hi	01054	Running
Function Code 06 and 16 (Write)		00061	Go	01055	Stop
41001 ~ 41002	Pre-tare value	00062	Lo	01056	Discharge starts
41003 ~ 41004	Zero Band value	00063	Lo-Lo	01057	Hold mode ON/OFF
41005 ~ 41006	Target value	00064	Peak ready	01058	Release "Hold value"
41007 ~ 41008	SP1 value	00065	Running	01059	Output judgement
41009 ~ 41010	SP2 value	00066	ZERO calibration	01060	ZERO calibration
41011 ~ 41012	SP3 value	00067	SPAN calibration	01061	SPAN calibration
41013 ~ 41014	LO_LO value	00068	Calibrate ERR0		
41015 ~ 41016	LO value	00069	Calibrate ERR2		
41017 ~ 41018	HI_HI value	00070	Calibrate ERR6		
41019 ~ 41020	HI value				
41021 ~ 41022	Under value				
41023 ~ 41024	Over value				
41025 ~ 41026	Peak value setting				
41101 ~ 41102	SPAN calibration value				

The settings marked in grey are not available.



Appendix 5 Examples for Input and Output of Modbus

☞ Examples here use Appendix 3 and can also be applied to appendix 4, with different Modbus Data Address.

☞ CRC : Error check code

Function code 03: Modbus (40000~40001) Weight Display

Name	Input	Description	Name	Output	Description
ID Address	01	Machine ID	ID Address	01	Machine ID
Function code	03		Function code	03	
Starting Address Hi	00	Register's starting address is 0 = 00 00 (HEX)	Byte Count	04	1 register per 2 bytes, and total of 4 bytes
Starting Address Lo	00		Data Hi (40000)	01	Data in 40000 500 ₍₁₀₎ = 01 F4 (HEX)
No. of Points Hi	00	40000~40001, 2 registers are used	Data Lo (40000)	F4	
No. of Points Lo	02		Data Hi (40001)	00	Data in 40001
			Data Lo (40001)	00	
CRC	04		CRC	BA	
	0B			3D	

Function code 05: Modbus (01000) write zero command

Name	Input	Description	Name	Output	Description
ID Address	01	Machine ID	ID Address	01	Machine ID
Function code	05		Function code	05	
Register's address	03	1000 ₍₁₀₎ = 03 E8(HEX) this address for "zero on/off"	Register's address	03	1000 ₍₁₀₎ = 03 E8(HEX) this address for "zero on/off"
	E8			E8	
ON/OFF	FF	FF 00 :zero on 00 00 : zero off	ON/OFF	FF	FF 00 :zero on 00 00 : zero off
	00			00	
CRC	0C		CRC	0C	
	4A			4A	

Function code 06: Modbus (41004) write zero band value

Name	Input	Description	Name	Output	Description
ID Address	01	Machine ID	ID Address	01	Machine ID
Function code	06		Function code	06	
Register's address	03	address for zero band value 1004 ₍₁₀₎ = 03 EC (HEX)	Register's address	03	address for zero band value 1004 ₍₁₀₎ = 03 EC (HEX)
	EC			E8	
Setting value	01	500 ₍₁₀₎ = 01 F4 (HEX)	Setting value	01	500 ₍₁₀₎ = 01 F4 (HEX)
	F4			F4	
CRC	48		CRC	48	
	6C			6C	

**Function code 06: Modbus (41026): write batch finish delay time write**

Name	Input	Description	Name	Output	Description
ID Address	01	Machine ID	ID Address	01	Machine ID
Function code	06		Function code	06	
Register's address	04	Batch Finish delay time address	Register's address	04	Batch Finish delay time address
	02	1026 ₍₁₀₎ = 04 02 _(HEX)		02	1026 ₍₁₀₎ = 04 02 _(HEX)
Setting value	00	Input value 7s is 0007 _(HEX)	Setting value	00	Input value 7s is 0007 _(HEX)
	07			07	
CRC	xx		CRC	xx	
	xx			xx	

Function code 01: Modbus (00000~00001): read current scale status

Name	Input	Description	Name	Output	Description
ID Address	01	Machine ID	ID Address	01	Machine ID
Function code	01		Function code	01	
Register's address	00	Starting Address	Bit	02	Read 2 Bit data: 2=10 ₍₂₎ , 00001 = 1 (return to zero) or 0 (non return to zero), 00000 = 0 (stable) or 1 (unstable)
	00				
Setting value	00	Read 2 status (2 Bit) 00000~00001			
	02				
CRC	BD		CRC	D0	
	CB			49	