SI 580E

DIGITAL INDICATOR

USER MANUAL

MANUAL Ver 4.00

PROGRAM Ver 5.00

SEWHACNM

주식회사 세화씨엔엠

CONTENTS

1. Precautions

1-1. Caution / Warning Marks

Warning Mark means there is possibility to get serious injury or to cause death If the product was not handled in a proper way.

1) Do not drop the product and avoid serious external damage on it.
2) Do not install the product under direct sunshine or severe vibration.
3) Do not install the product under conditions with high voltage or severe electric noise.
4) Turn off the power when you use it with external input devices.
5) Do not sprinkle water on the product or avoid rainy conditions.

Caution Mark means there is possibility to cause material loss if the product was not handled in a proper way.

1) The products can be changed without previous notice as the version is upgraded.
2) As version is upgraded the product version increases and all of the function will remain if possible.
3) Do not use the product at conditions with fluctuating temperature or severe vibration.

1-2. Copyrights

3) This manual can be changed without previous notice as the version is upgraded. If you have any kind of inquiries, please contact your local agent or the Headquarter, SEWHACNM Co., LTD.

1-3. Inquiries

If you have any kinds of inquiries for this model, please contact your local agent or Head Office.

1) Head office : SEWHACNM CO., LTD.
2) Website : http://www.sewhacnm.co.kr
3) Email : sales@sewhacnm.co.kr

2. Introduction

2-1. Introduction

Thank you for Purchasing “SI 580E”, the digital weighing indicator. This product is a high-quality indicator connectible to other external devices and has high resolution. Plus, Serial Interface(RS232C, RS422, RS485) with Modbus Protocol is available for user’s convenience. Please learn and review this manual before use it and enjoy all of the function of this product.

2-2. Feature

1) Since this product is DIN standard size, it is easy to install in a panel.

2) Front display is covered with Polycarbonate film, strong against dust and water.

3) Serial interface RS232C / RS422 (or RS485) and Analog output 4~20mA (or 0~10V) available. (Modbus Protocol available)

2-3. Components

	
Indicator	Manual

3. Specification

3-1. Specification

Content			Specification
Load Cell Input Analog Signal	Display Resolution		1/20,000
	Internal Resolution		1/2,000,000 (±1,000,000)
	Input Sensitivity		Min 0.1μV/V
	Max Signal Input Voltage		Max 3.2mV/V
	Load Cell Excitation		DC +5V
	A/D Converting Method		Sigma-Delta
	Decimal Point		0, 0.0, 0.00, 0.000
	Drift	Zero	10PPM/°C
		Span	10PPM/°C
	Non Linearity		0.001% max
Operating Environment	Operating Temperature Range		-10°C ~ +40°C [14°F ~ 104°F]
	Operation Humidity Range		40% ~ 85% RH, No Condensation
Front Part	Display		15mm(0.56inch), 6 digits red FND(Number/Word) State(Lamp) 7 digits, Red LED
	Key		5EA
Interface	Digital input		4EA, Dry Contact(Zero Voltage Contact)
	Relay Output		4EA, Contact rate : 125V 0.5A AC / 24V 1A DC
	Serial interface	RS-422/485	Stream mode, Command mode, Modbus(RTU), Serial interface print
		RS-232	
	Analog output		0~10V, 4~20mA (Selectable)
Power	DC 12~24V (SMPS not included, subject of advice : 24V 1A), Power consumption Max 12W AC (option) : 110~220V, 50~60Hz, 0.5A, Power consumption max 12W		
Size	Size : 97mm(W) x 49mm(H) x 112mm(D), Weight : 350g		

3-2. Front

3-2-1. Display and key pad

① **Display : Number/word display 6 digits red FND**

② **Condition(lamp)**

- STEADY : Current weight is steady
- ZERO : Current weight is zero
- TARE : Using Tare function
- OUT1 : Relay Out 1 operating
- OUT2 : Relay Out 2 operating
- OUT3 : Relay Out 3 operating
- OUT4 : Relay Out 4 operating

③ **Keypad**

3-2-2. Key

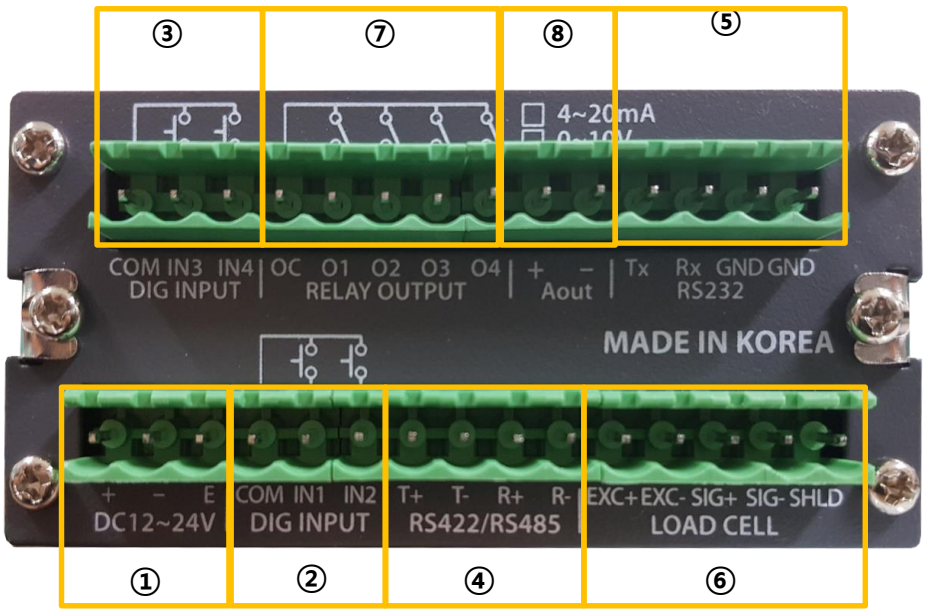
ZERO	- Set zero point - Clear or Cancel
TARE	- Tare set or Tare reset (Does not work under Hold condition or when weight value is ZERO) - Calibration Mode : Move the cursor to the left - Function setting : Move the cursor to the left
HOLD	- Hold set or Hole reset ※ “H” mark displays under Hold state - Move the cursor to the right.
PRINT	- Print - Enter Test Mode 2 - Increase set value - Saving data under set F103-0/4/5
F	- Enter Set-Up Mode - Enter Hidden Function Mode - Save the value & Move to next step

3-2-3. Key combination

F ➡ TARE	Double Tare setiing
F ➡ PRINT	If there is a print connected, print Total. (Total cannot be checked on display)

1. Max accumulated weighing count : 999,999times.
Over 999,999times return to “0” time
2. Max accumulated weight display : 999999999 (g, kg, ton)
Over 999,999,999 (g, kg, ton) return to “0” (g, kg, ton)

3-3. Rear panel



① DC(basic)/AC(option) Power Input Terminal

② External Input Terminal 1 : Dry contact only (zero voltage point)

③ External Input Terminal 2 : Dry contact only (zero voltage point)

④ Serial Interface 1 (RS422/485)

⑤ Serial Interface 2 (RS232)

⑥ Load Cell Input Terminal

⑦ Relay Out Terminal

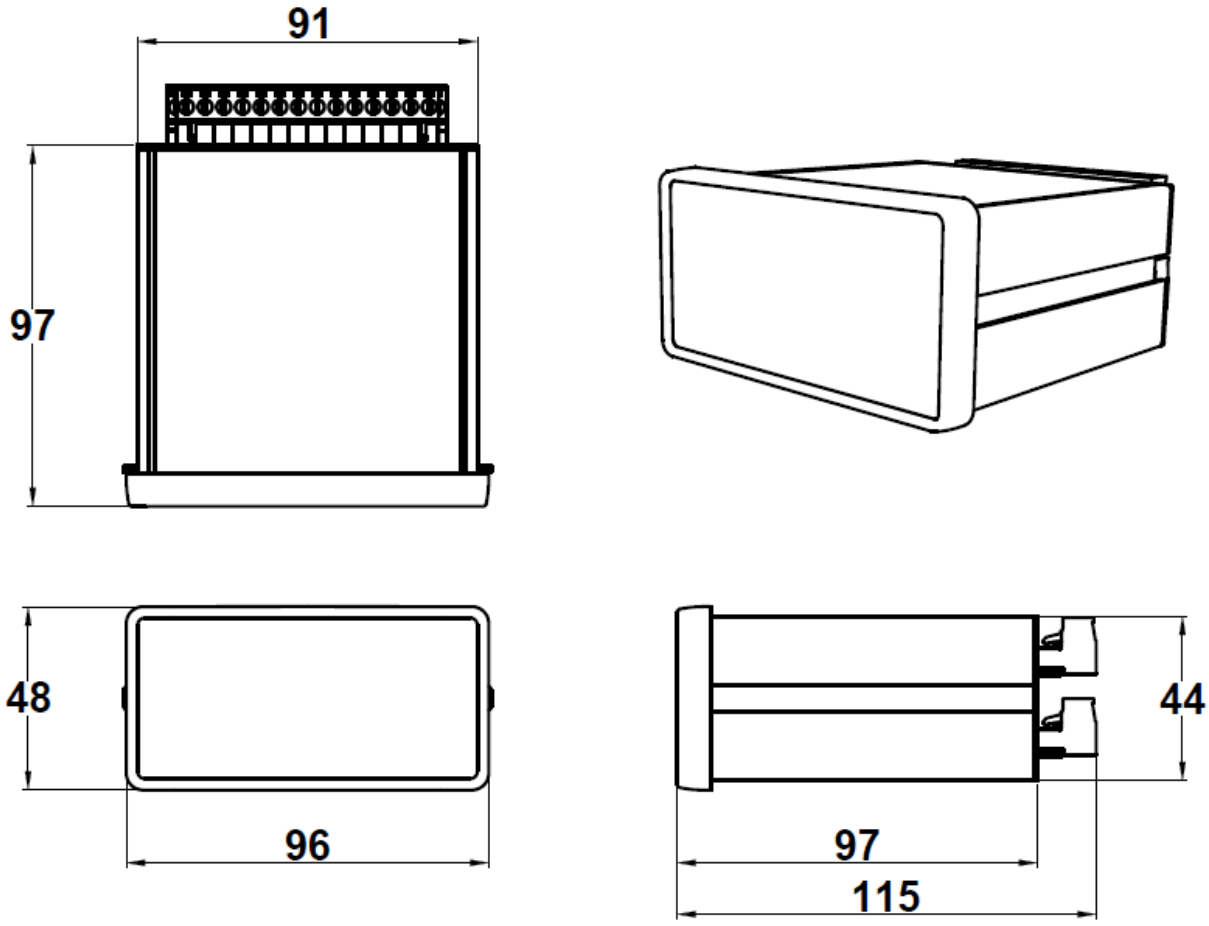
⑧ Analog Out Terminal

warning

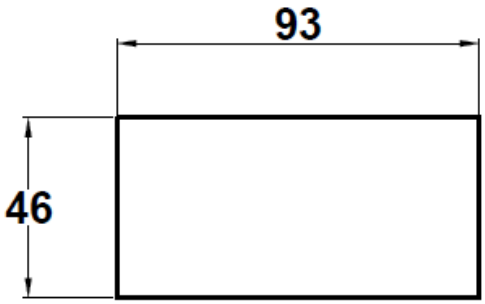
Check the standard Interface and optional specification of the product before installation.

4. Installation

4-1. Size (Unit : mm)



4-2. Panel Cutting Size (Unit : mm)



4-3. Load cell Installation

How to install load cell input terminal

(The color of the cables can differ from each manufacturer.)

warning

1. If you use tension type of load cell as compression type, connect SIG+ and SIG- crossly.
2. The product can be damaged if you connect other cable to load cell input terminal.
3. Turn off the power of the indicator during connection to load cell.
4. Do not weld around the device.
   (Parts of internal circuit of indicator or load cell can be broken during arc welding or electric welding.)

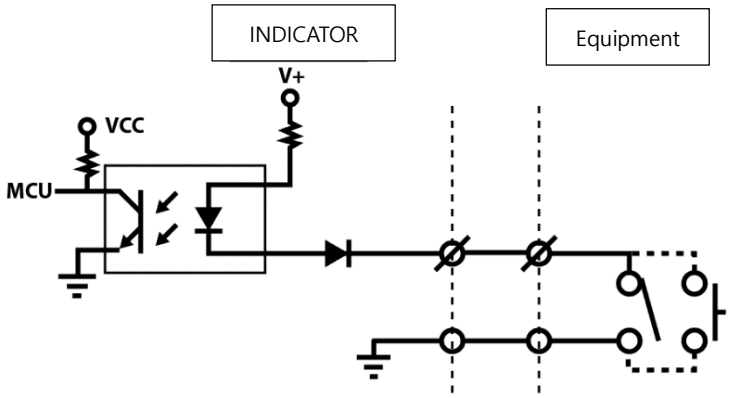
warning

※ Precautions for Indicator-Load Cell Connection

1. You can use a maximum of 8 load cells. (350Ω standard)
2. The product has to be horizontal to the ground for more precise value.
3. Use summing box to adjust output deviation minimally when you install load cell more than two. (Each output gap can cause a margin of error.)
4. Change in temperature can cause a margin of error.
5. Do not weld around the device. If you need, disconnect every cable of indicator.
6. If you weigh static electricity, use earth shield wire or other ways to protect static electricity flowing in Indicator.

4-4. External Input

1) Each external Input can be set on F233~236
2) Dry contact for Input Signal

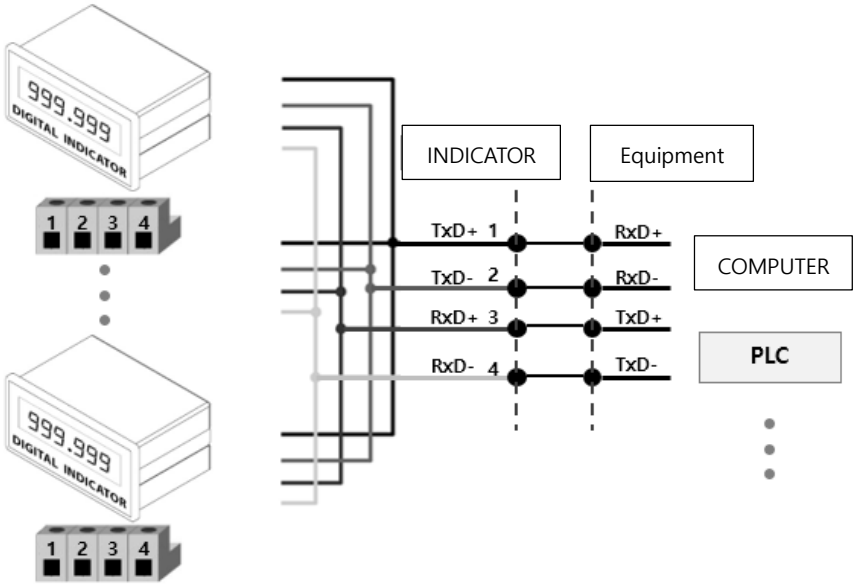


3) Terminal component
   - Top, Bottom
   - COM : Input common terminal
   - IN1~IN4: Input Signal Terminal (Dry contact-relay or switch signal)

4-5. Serial interface

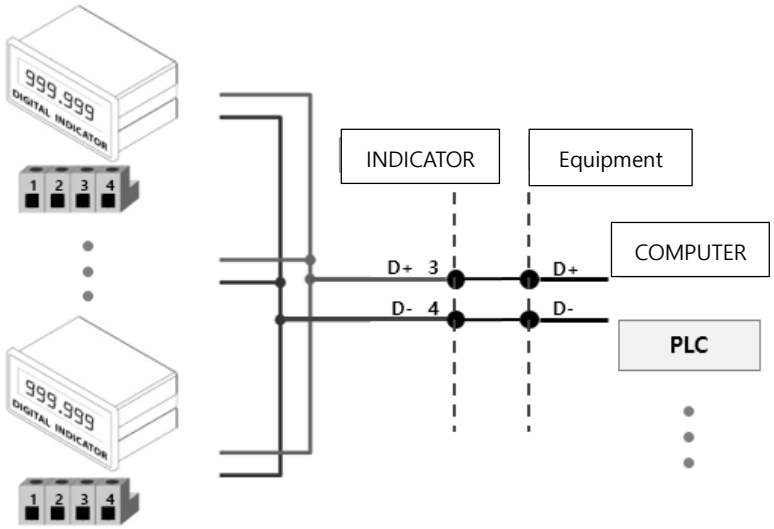
4-5-1. RS422

RS422 Interface is available for long-distance communication (within 1km) since it is strong against electric noise. You can connect up to 32EA of devices like PC, PLC, Printer through Multi-Drop Method.



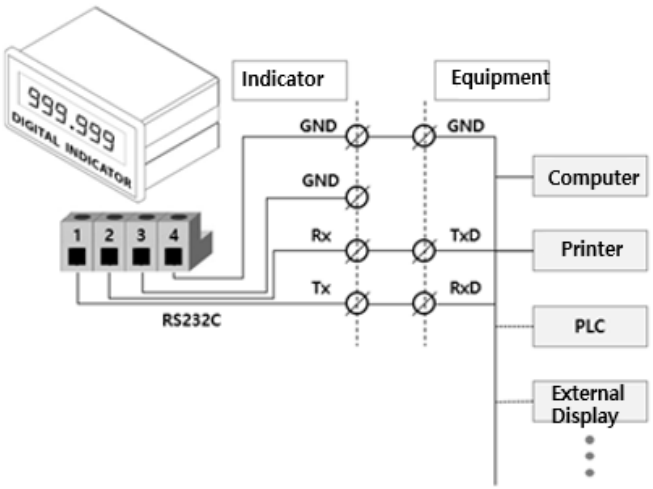
4-5-2. RS485

RS485 Interface is available for long-distance communication (within 1km) since it is strong against electric noise. Although this Interface is slow compared to RS422, but you can connect up to 32EA of devices like PC, PLC, Printer through Multi-Drop Method.



4-5-3. RS232C

RS232C Interface is adequate for short distance communication like PC, PLC, printer, external display and etc since it is weak in electric noise.



warning

Since Serial Interface is vulnerable to electric noise, Use twisted shielded cable to minimize communication disruption.

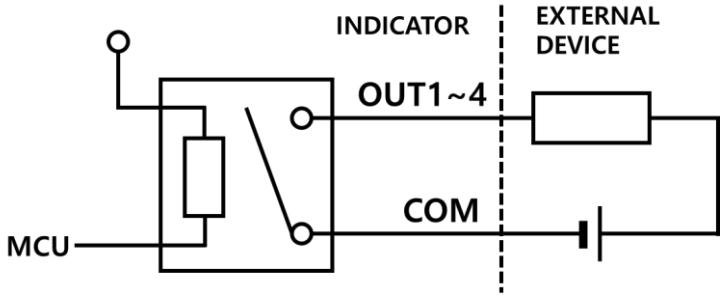
4-6. Relay out

Each Relay Out can be set on F226~229

4-6-1. Relay specification

Coiling Rating	12VDC
Contact Ratings	1A 24VDC

4-6-2. Relay Out Inner Circuit



1) Terminal Component

-OUTCOM : Output common terminal

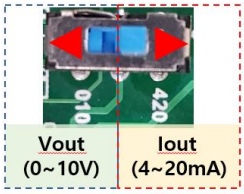
-OUT1~OUT4 : Output signal terminal (Zero voltage output)

4-7. Analog output

※ How to select Analog Output (Iout or Vout)

① Switch Iout or Vout through a deep switch installed inside of Indicators or option cards.

② Select Analog Output option on HF13 and save the setting value.



4-7-1. Analog Current Output (4~20mA)

Analog Output Interface 4~20m transmit displayed weight data to the external devices like PC, recorder, PLC, external display, etc through current output.

Current output	Resolution	Temperature coefficient	Max load impedance
4mA ~ 20mA	1/1,000	0.01%/°C	500Ω MAX.

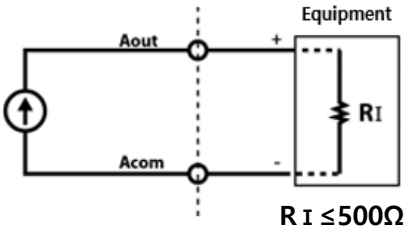
warning

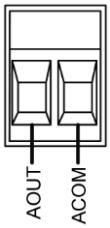
- Analog Output does not work during calibration or Ad-Err.

- If it stop working, the last value maintains.

- It in not adequate for the system which demands high-accuracy over 1/1,000.

1) Circuit Composition and Connection





AOUT	ACOM
+	-

Analog Current Output Interface transmit analog current(4~20mA) commensurate with the displayed weight

2) Analog Current Output Adjustment (HF13-00)

① Default is : 4mA output for Zero, 20mA output for Max Capacity.

② If there is a gap in value caused by distance or environment, the way to adjust is as following ③.

③ How to adjust Analog Output

- When the weight is zero but output is not 4mA, you can adjust the gap on HF14.
- When the weight is Max Capacity but output is not 20mA, you can adjust the gap on HF15.

4-7-2. Analog Voltage Output (0~10V)

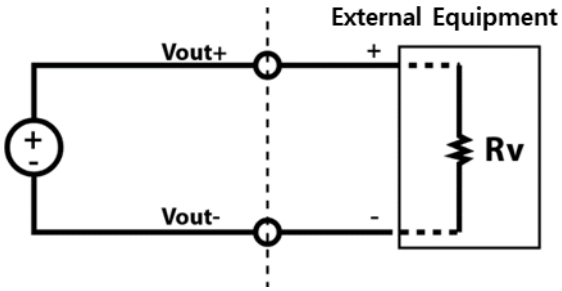
Analog Output Interface 0~10V transmit displayed weight data to the external devices like PC, recorder, PLC, external display, etc through voltage output.

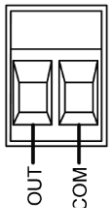
Output voltage	0~10VDC output
Accuracy	1/1,000

Caution

- **Analog Output does not work during calibration or Ad-Err.**
- **If it stops working, the last value maintains.**
- **It in not adequate for the system which demands high-accuracy over 1/1,000.**

1) Circuit Composition and Connection





VCOM	VOUT
-	+

Analog Voltage Output Interface transmit analog voltage(0~10V) commensurate with the displayed weight

2) Analog Current Output Adjustment (HF13-01)

① Default is : 0V output for Zero, 10V output for Max Capacity.

② If there is a gap in value caused by distance or environment, the way to adjust is as following ③.

③ How to adjust Analog Output

- When the weight is zero but output is not 0V, You can adjust the gap on HF14
- When the weight is Max Capacity but output is not 10V, You can adjust the gap on HF15

5. Set-up

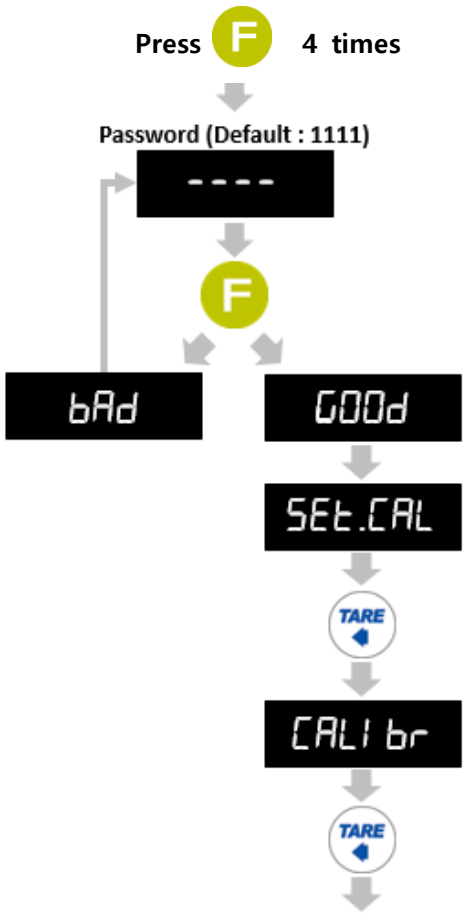
5-1. Calibration

Calibration is a work to correct linearity from zero to Max Capacity, which becomes standard when an indicator displays the current weight.

warning

- When enter Calibration mode, Tare/Hold/Print function is initialized.
- Preheat the Indicator for 5 minutes before Calibration to get more exact result.

Step 1. Enter Calibration mode



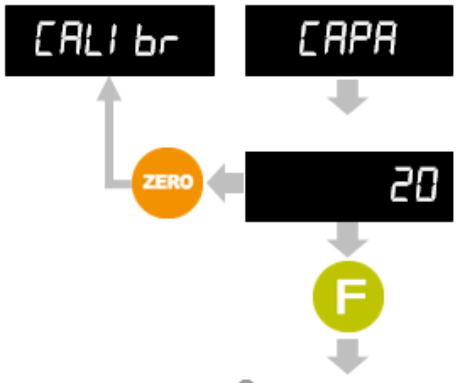
<Password Key>

- TARE : Number 1
- HOLD : Number 2
- PRINT : Number 3

<Other key>

- F : Enter and Move to next step
- ZERO : Cancel

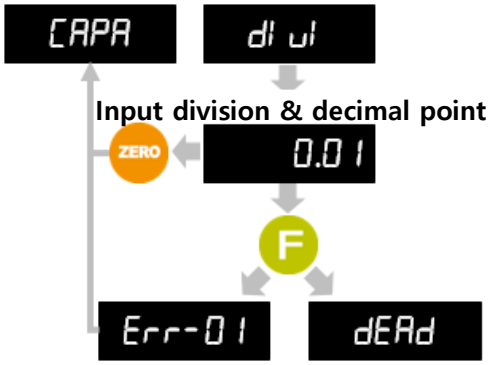
Step 2. Set Maximum Capacity



- TARE, HOLD : Move the cursor
- PRINT : Increase the number
- F : Save and move to next step
- ZERO : Cancel and move to previous step

Ex : When you want to set 20.00kg (division 0.01kg) for capacity, input 20.

Step 3. Set Decimal Point and Division



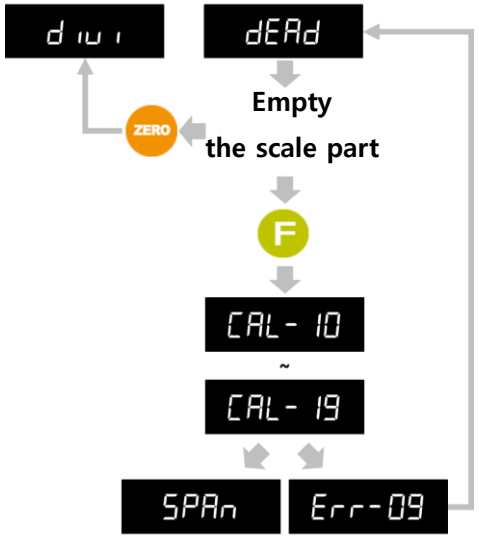
- HOLD : Move decimal point
- PRINT : Increase division
- F : Save and move to next step
- ZERO : Cancel and move to previous step

※ You can set the decimal point to 3 places (0, 0.0, 0.00, 0.000) and division can be set as 1, 2, 5, 10, 20, 50.

※ The value of (Max capacity/Division) should not be over 20,000.

※ If the value of (Max capacity/Division) is over 20,000, “Er-001” will show up and you have to start from “Step 3. Set Maximum Capacity” again.

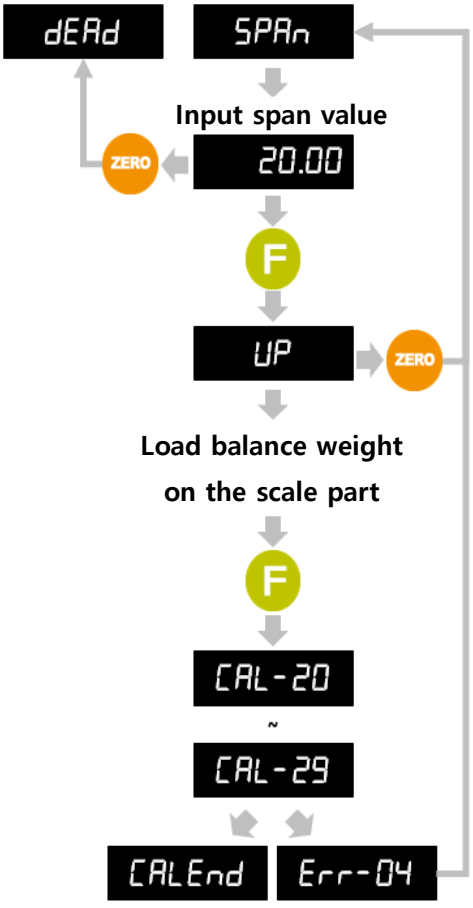
Step 4. Measure Dead Weight



- F : Save and move to next step
- ZERO : Cancel and move to previous step

※ If "Er-009" shows up, check if there is anything on the scale part or vibration which interrupt calculation of the indicator.

Step 5. Span Calibration



- TARE, HOLD : Move the cursor
- PRINT : Increase Number
- F : Save and move to next step
- ZERO : Cancel and move to previous step

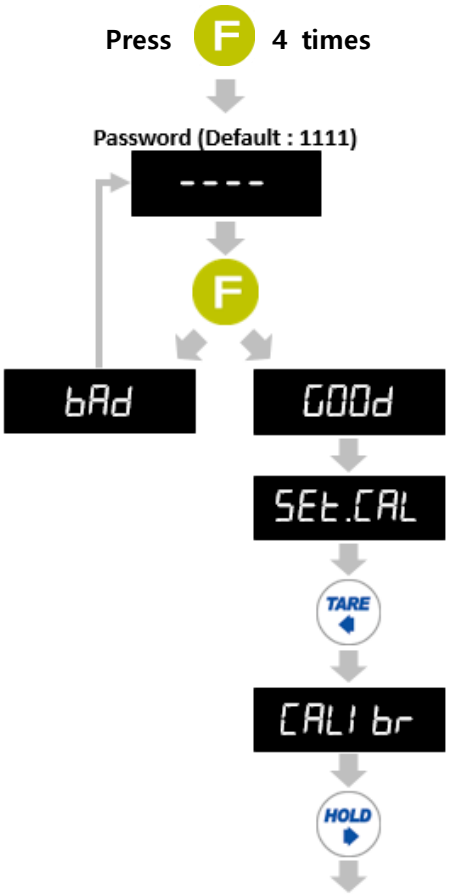
※ Er-004 : The balance weight is over Max capacity

※ Er-005 : The balance weight is under 10% of Max capacity

5-2. Simulation Calibration

You can proceed with Simulation Calibration when you do not have any balance weight. It is the way to calculate and adjust weight via Max capacity of load cell and Rated Output Value. The guaranteed accuracy of simulation calibration is 1/3,000 and it can differ from the accuracy of Rated Output Value of load cell.

Step 1. Enter Simulation Calibration mode



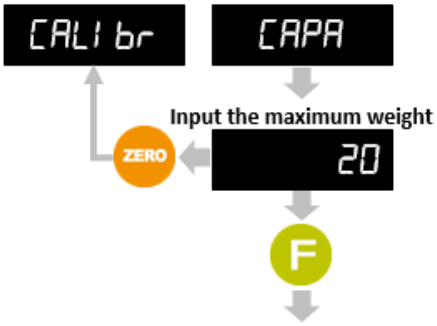
<Password Key>

- TARE : Number 1
- HOLD : Number 2
- PRINT : Number 3

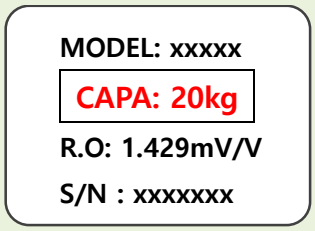
<Other key>

- F : Enter or Move to next step
- ZERO : Cancel

Step 2. Set Maximum Capacity



- TARE, HOLD : Move the cursor
- PRINT : Increase number
- F : Save and move to next step
- ZERO : Cancel and move to previous step

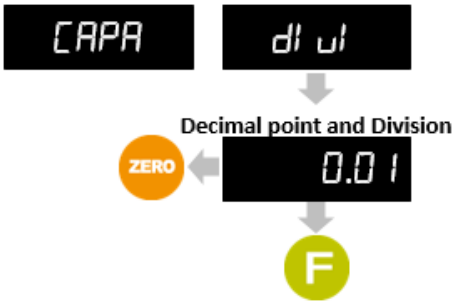


<Load Cell Label Explanation >

※ Capacity in Simulation Calibration means the capacity written on load cell label.

※ Input the capacity of load cell multiplied by the number of load cell.
(number of load cell * capacity of load cell)

Step 3. Set Decimal Point and Division



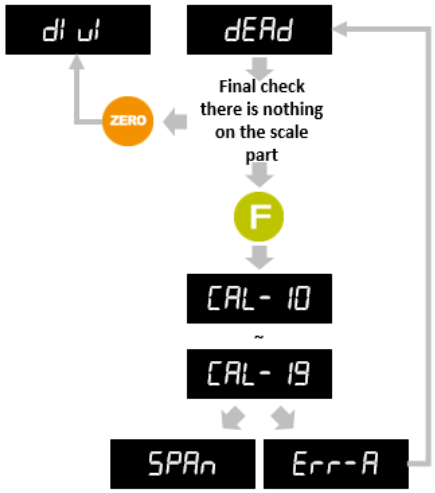
- HOLD : Move the decimal point
- PRINT : Increase division value
- F : Save and move to next step
- ZERO : Cancel and move to previous step

※ You can set the decimal point to 3 places (0, 0.0, 0.00, 0.000) and division can be set as 1, 2, 5, 10, 20, 50.

※ The value of (Max capacity/Division) should not be over 20,000.

※ If the value of (Max capacity/Division) is over 20,000, “Er-001” will show up and you have to start from “Step 2. Set Maximum Capacity” again.

Step 4. Measure Dead Weight

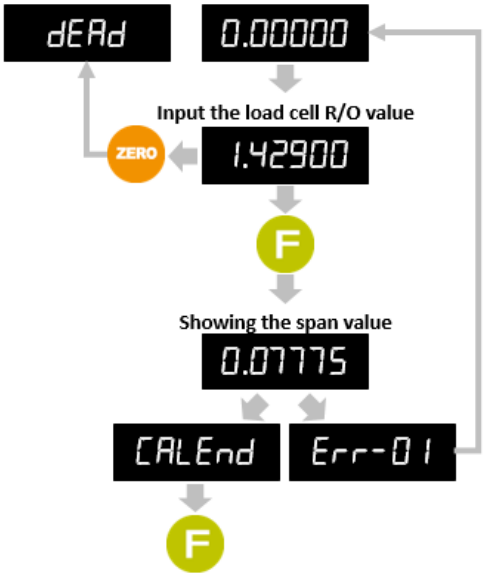


※ F : Save and move to next step

※ ZERO : Cancel and move to previous step

※ If "Er-009" shows up, check if there is anything on the scale part or vibration which interrupt calculation of the indicator.

Step 5. Set R.O.V (Rated Output Voltage/mV)



- TARE, HOLD : Move the cursor
- PRINT : Increase number
- F : Save and move to next step
- ZERO : Cancel and move to previous step

MODEL: xxxxx
CAPA: 20kg
R.O: 1.429mV/V
S/N : xxxxxxx

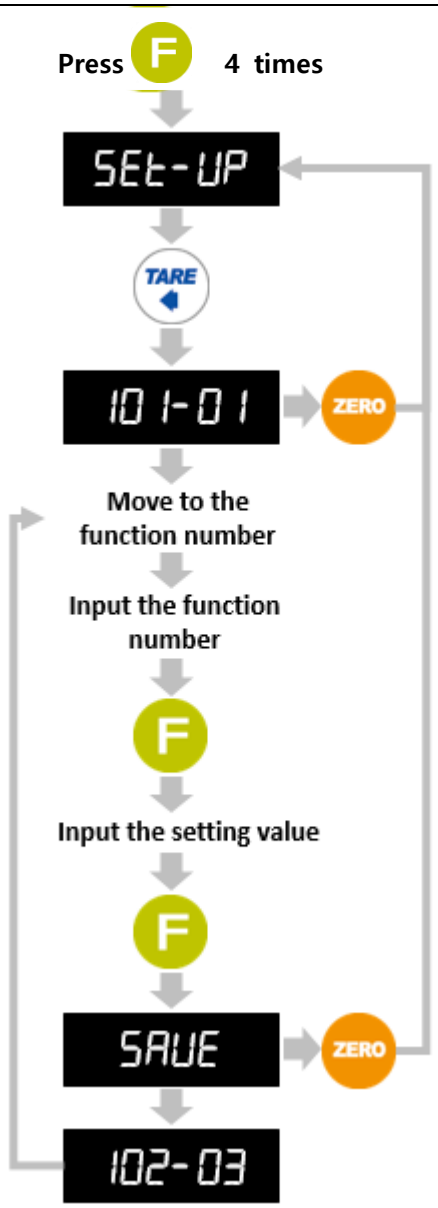
<Load Cell Label Explanation >

※ "Er-001" means you input wrong value. In this case, you need to check load cell label again.

5-3. Function Mode

Function Setting makes indicator operate perfectly with surrounding condition.

5-3-1. How to Enter Function Mode



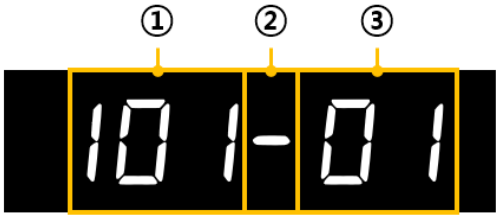
① TARE, HOLD : Move the cursor

② PRINT : Increase number

③ F : Save and move to next step

④ ZERO : Cancel and move to previous step

※ Display Explanation



1. Function number
2. PRINT : Increase Function Number
3. Setting value

5-3-2. F-Function List

No.	Subject	Default	Content
101	ID Number	01	01~99 ID number
102	Weight Back-up Mode	02	00 : Normal Mode 01 : Zero/Tare Back-Up Mode 02 : Zero Back-Up Mode
103	Weighing Data Saving Method	03	00 : Manual (When Print key is input) 01 : Auto (At every steady state) 02 : Auto (At the first steady state) 03 : Auto (After weighing is finished) 04 : Manual or Auto (at every steady state) 05 : Manual or Auto (At the first steady state) 06 : Manual or Auto (After weighing is finished)

◆ Weighing data saving method

Weighing data saving method (F03)		Print Input	Print Output Data	Saved Data
00	Manual	○	Current Weight	Current Weight
		X	X	X
01	Auto (At every steady state)	○	Recent Steady Weight	X
		X	Steady Weight	Steady Weight
02	Auto (At the first steady state)	○	Recent Steady Weight	X
		X	Steady Weight	Steady Weight
03	Auto (After weighing is finished)	○	Recent Steady Weight	X
		X	Steady Weight	Steady Weight
04	Manual or Auto (at every steady state)	○	Current Weight	Current Weight
		X	Steady Weight	Steady Weight
05	Manual or Auto (At the first steady state)	○	Current Weight	Current Weight
		X	Steady Weight	Steady Weight
06	Manual or Auto (After weighing finished)	○	Current Weight	Current Weight
		X	Steady Weight	Steady Weight

No.	Subject	Default	Content
104	Display Up-Date Speed	09	01 : 1time/sec 04 : 6time/sec 07 :20time/sec 02 : 2time/sec 05 :10time/sec 08 :30time/sec 03 : 3time/sec 06 :15time/sec 09 :60time/sec
105	Display lightness	02	00 : Low ~ 07 : High
108	Buzzer Alarm for External Input Detection	00	00 : enable 01 : disable
110	Weight Unit	00	00 : kg 01 : g 02 : ton
111	Print Language	00	00 : Korean 01 : English
201	Near Zero Range	10	00~ 999999 - Begin 00 value and enter when press F key
202	Auto Zero Range	00	00 ~ 99 (Unit 1 = 0.25 division)
203	Steady Range	08	01~99 (Unit 1 = 0.25 division)
204	Steady Condition Check Time	10	01~99 (Unit : 0.1 sec.)
205	Digital Filter	10	01:Weak vibration ~ 99:Strong vibration
206	Zero Key Operation	00	00:Always active 01:Active under steady condition only
207	Tare Key Operation	00	00:Always active 01:Active under steady condition only
209	Zero Key Range	02	00: Active within 2% of Max Capacity 01: Active within 5% of Max Capacity 02: Active within 10% of Max Capacity 03: Active within 20% of Max Capacity 04: Active within 50% of Max Capacity 05: Active within 100% of Max Capacity 06:No limit

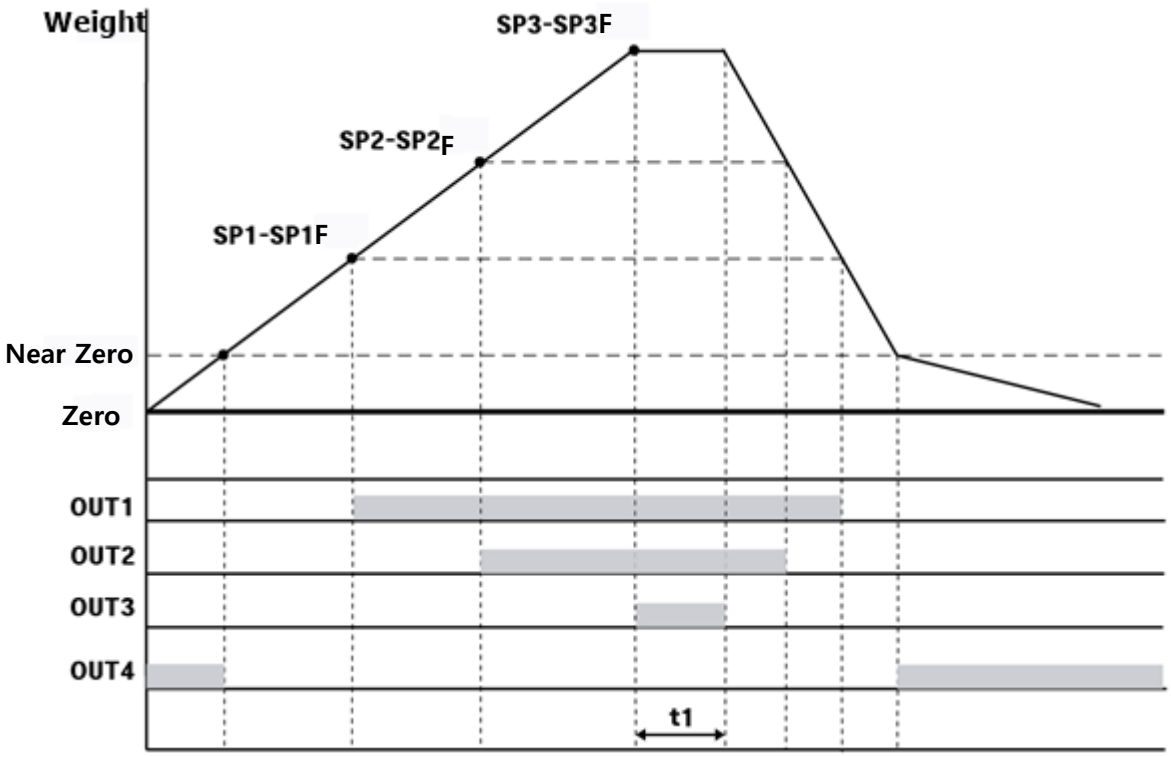
No.	Subject	Default	Content
210	Tare key Range	02	00: Active within 10% of Max Capacity 01: Active within 20% of Max Capacity 02: Active within 50% of Max Capacity 03: Active within 100% of Max Capacity
211	Auto Zero After Tare Key Input	00	00 : disable 01 : enable
212	Tare Delay Time	0	00 : Disuse 01 ~ 10:Use (Unit : 1second)
213	Auto tare for “RUN”	00	00 : disable 01 : enable
214	Auto Tare Reset	00	00 : disable (Manual reset) 01 : Auto Reset under Near Zero range 02 : Auto Reset under Steady state 03 : Auto Reset after weighing finishes
215	Auto Tare Reset Delay Time	00	00 : disable (right after Key or External input) 00 ~ 09 : enable (Unit : 1 second)
216	Hold Mode	00	00:Sample Hold 01:Peak Hold 02:Average Hold
217	Hold Delay Time	00	00 : disable (right after Key or External input) 01 ~ 10 : enable (Unit : 1 second)
218	Hold Reset within Near Zero Range	00	00: disable 01: enable
219	Auto Hold Reset Delay Time	00	00 : disable (right after Key or External input) 01 ~ 10 : enable (Unit : 1 second)
220	Average Hold Time	10	01 ~ 09 (Unit : 0.1 second)
221	Minus Mark (-) Display	00	00 : enable 01 : disable
222	Current Weight Display During UnPass/OverLoad	00	00 : Enable 01 : Disable

No.	Subject	Default	Content
223	Weighing Mode	01	00 : Disuse 01 : Limit mode 1 02 : Limit mode 2 03 : Limit mode 3 04 : Packer mode 1 05 : Packer mode 2 06 : Packer mode 3 07 : Accumulation Mode 1 08 : Accumulation Mode 2
224	Weighing Method Setting	00	00 : Absolute value 01 : Positive value
225	Relay Standard (A, B contact)	00	00: Auto Setting 01 : Manual Setting
226	Relay Out 1	xx	00 : Disuse 01 : Near Zero 02 : SP1 03 : SP2 04 : SP3 05 : SP4 06 : Finish
227	Relay Out 2	xx	
228	Relay Out 3	xx	
229	Relay Out 4	xx	
233	External Input 1	01	00 : disuse 01 : Zero 02 : Tare 03 : Tare reset 04 : Tare/Tare reset 05 : Hold 06 : Hold reset 07 : Hold/Hold reset 08 : Run 09 : Stop 10 : Run/Stop 11 : Print 12 : Print Total
234	External Input 2	04	
235	External Input3	07	
236	External Input4	11	
239	Finish Relay Delay Time	10	00 : Relay out right after Steady state 20 : Relay out after 2.0 sec 99 : Relay out after 9.9 sec
240	Finish Relay Output Time	10	01 : Relay out for 0.1 sec 20 : Relay out for 2.0 sec
251	Zero State Lamp	00	00 : Near Zero (Absolute value) 01 : Zero 02 : Near Zero (Positive value)

No.	Subject	Default	Content
253	Near Zero Relay During Tare State	00	00 : ON when displayed weight is zero 01 : ON when gross weight excluding tare weight
Function no. 301~306 : Serial Interface RS422/RS485(COM1) Setting **Function no. 308~313 : Serial Interface RS232C(COM2) Setting**			
301 (COM1) 308 (COM2)	Data bit/Stop bit/ Parity	00	00:Databit 8, Stopbit 1, Paritybit Non 01:Databit 8, Stopbit 1, Paritybit Odd 02:Databit 8, Stopbit 1, Paritybit Even 03:Databit 7, Stopbit 1, Paritybit Odd 04:Databit 7, Stopbit 1, Paritybit Even
302 (COM1) 309 (COM2)	Baud Rate	02	00 : 2,400bps 05 : 28,800bps 01 : 4,800bps 06 : 38,400bps 02 : 9,600bps 07 : 57,600bps 03 : 14,400bps 08 : 76,800bps 04 : 19,200bps 09 : 115,200bps
303 (COM1) 310 (COM2)	Communication Mode	00 01	00: Stream mode 01: Command mode 02: Print mode 03: Modbus (RTU)
304 (COM1) 311 (COM2)	Command Checksum (F303-01/F310-01)	00	00 : Disuse 01 : Use
305 (COM1) 312 (COM2)	Serial Interface Stream Mode Protocol	00	00 : format1 (18byte) 04 : format5 (10byte) 01 : format2 (21byte) 05 : format6 (10byte) 02 : format3 (17byte) 06 : format7 (8byte) 03 : format4 (22byte)

No.	Subject	Default	Content	
306 (COM1) 313 (COM2)	Stream Mode Data Output (F202-00)	00	00 : continuous 01 : 1 time at every steady state 02 : 1 time at the first steady state (over Near Zero) 03 : 1 time after weighing is finished 04 : Input F Key	
352	Print Format Setting	00	00: Continuous Print 01: Single Print	
354	Print Output Delay Time Setting	00	00~09 (Unit: 1 second)	
355	Paper withdraw rate (continuous / single)	00	00 ~ 09 (unit : 1line)	
356	Paper withdraw rate (total/ sub-total)	00	00 ~ 09 (unit : 1line)	
358	Delete contents after printing total	00	00 : delete 01 : disable	
401	Analog Output Range	00	00: Absolute value (-, +) 01: Positive value (+)	
402	Analog Output Direction	00	00 : Forward (4~20mA, 0→10V) 01 : Reverse (20~4mA, 10→0V)	
403	Analog Max Output Standard	00	00 : Max Capacity 01 : SP1 02 : SP2	03 : SP3 04 : SP4 05 : Max Capacity (Gross value under Tare state)

◆ Weighing Mode 1 – Limit mode (Function 223-01)



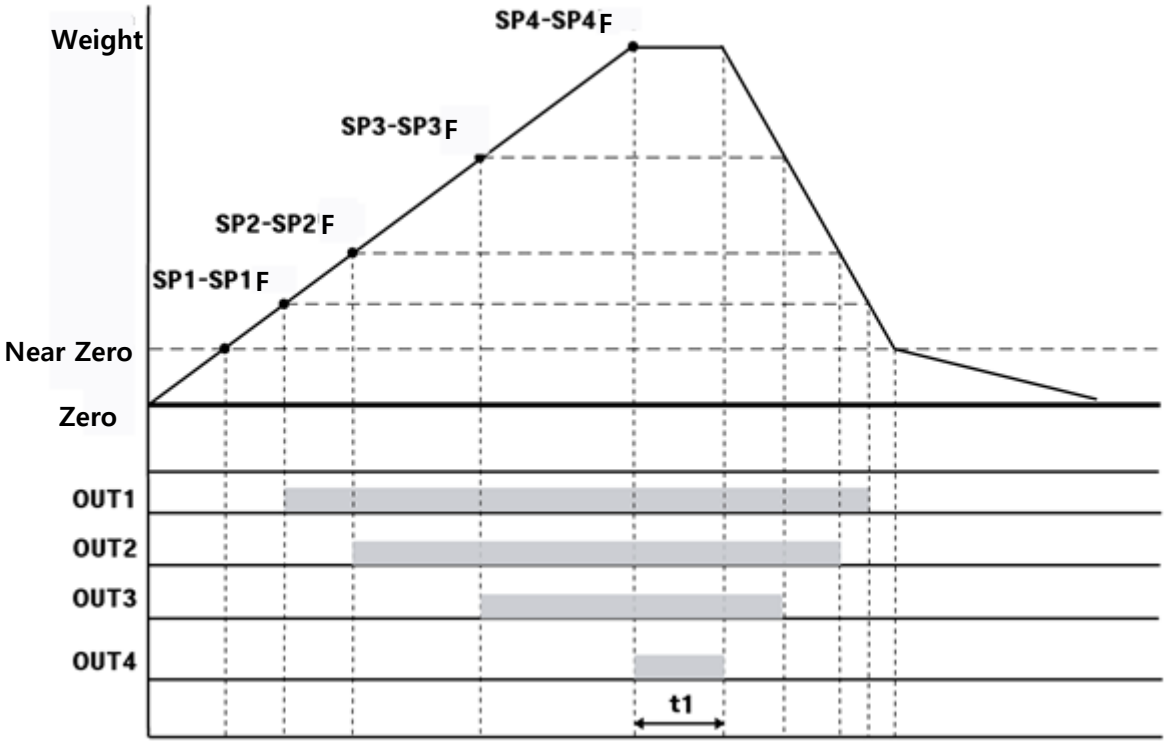
Time

Time	Content
t1	Finish Relay Delay Time (F239) In the case of F103-3 or F103-6, save the date after t1 time.

Relay Out

Relay	Condition	Relay	Condition
OUT 1	Current weight ≥ SP1-SP1F (ON) Current weight < SP1-SP1F (OFF)	OUT 2	Current weight ≥ SP2-SP2F (ON) Current weight < SP2-SP2F (OFF)
OUT 3	Current weight ≥ SP3-SP3F (ON) Current weight < SP3-SP3F (OFF)	OUT 4	Within Near Zero range (HF11) (ON)

◆ Weighing Mode 2 – Limit mode (A contact) (Function 223-02)



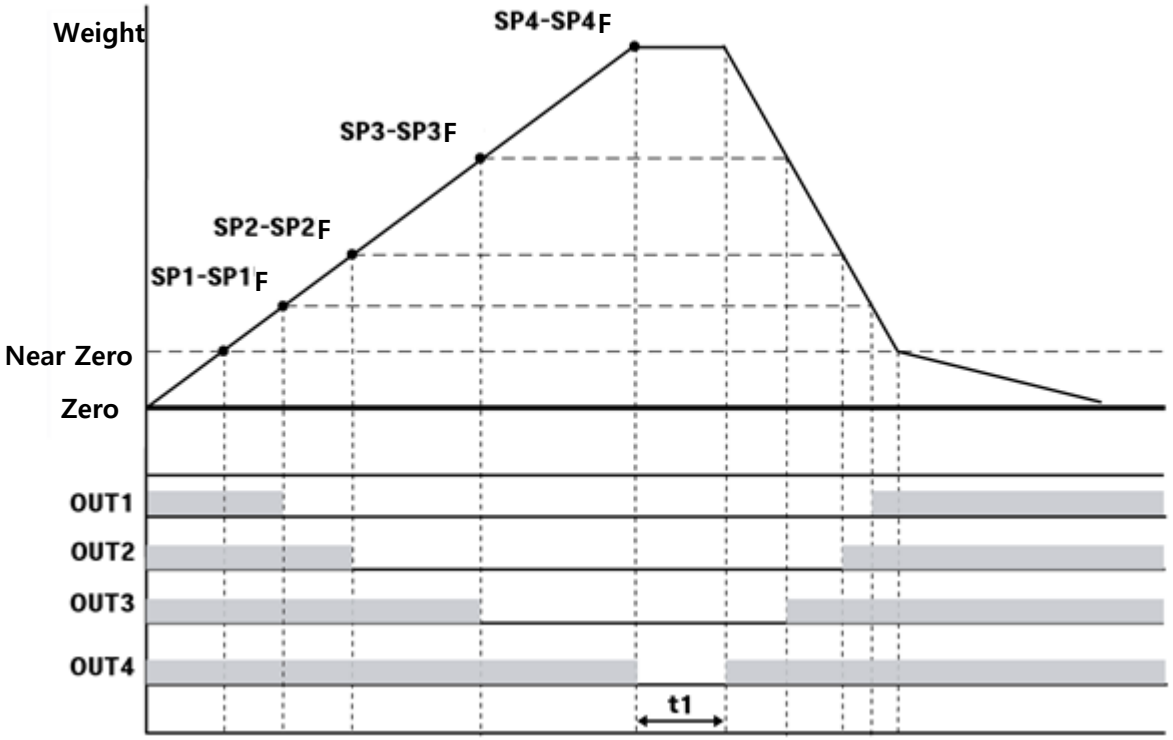
Time

Time	Content
t1	Finish Relay Delay Time (F239) In the case of F103-3 or F103-6, save the date after t1 time.

Relay Out

Relay	Condition	Relay	Condition
OUT 1	Current weight ≥ SP1-SP1F (ON) Current weight < SP1-SP1F (OFF)	OUT 2	Current weight ≥ SP2-SP2F (ON) Current weight < SP2-SP2F (OFF)
OUT 3	Current weight ≥ SP3-SP3F (ON) Current weight < SP3-SP3F (OFF)	OUT 4	Current weight ≥ SP4-SP4F (ON) Current weight < SP4-SP4F (OFF)

◆ Weighing Mode 3 – Limit mode (B contact) (Function 223-03)



Time

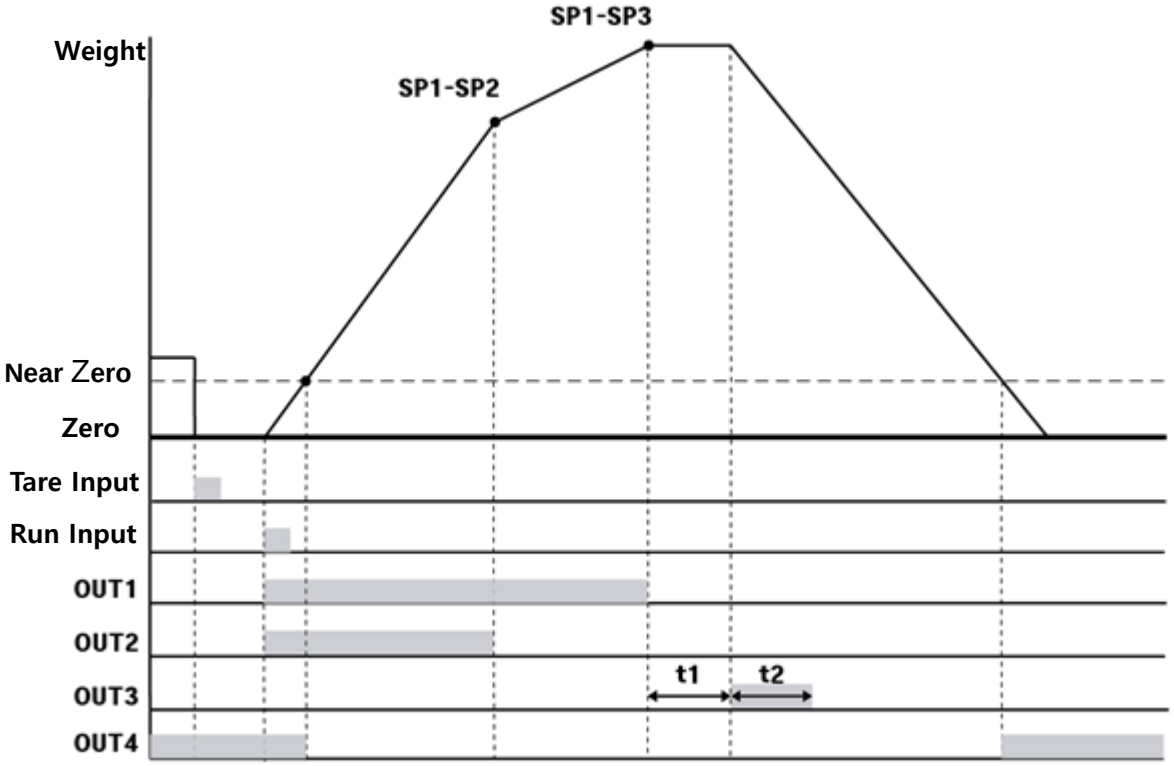
Time	Content
t1	Finish Relay Delay Time (F239) In the case of F103-3 or F103-6, save the date after t1 time.

Relay Out

Relay	Condition	Relay	Condition
OUT 1	Current weight < SP1-SP1F (ON) Current weight≥SP1-SP1F (OFF)	OUT 2	Current weight < SP2-SP2F (ON) Current weight≥SP2-SP2F (OFF)
OUT 3	Current weight < SP3-SP3F (ON) Current weight≥SP3-SP3F (OFF)	OUT 4	Current weight < SP4-SP4F (ON) Current weight≥SP4-SP4F (OFF)

◆ Weighing Mode 4 - Packer Mode 1 (F223 – 04)

- 2-stage Control



Weight Setting

SP1	SP2	SP3
Target Value	Drib	Free fall

Time

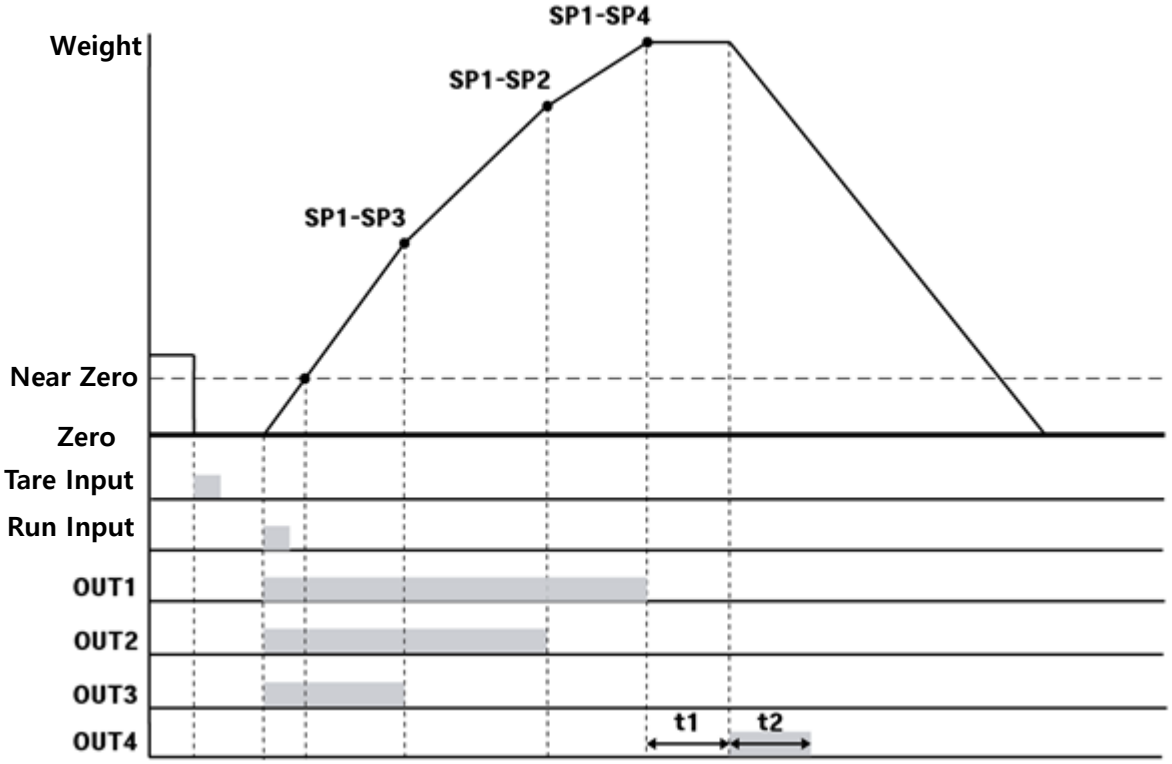
Time	Content
t1	Finish Relay Delay Time (F239) In the case of F103-3 or F103-6, save the date after t1 time.
t2	Finish Relay Output Time (F240)

Relay Out

Relay	Contents	Relay	Contents
OUT 1	Input Run (ON) Current weight ≥ SP1 – SP3 (OFF)	OUT 2	Input Run (ON) Current weight ≥ SP1 – SP2 (OFF)
OUT 3	Current weight ≥ SP1 – SP3 After t1, During t2	OUT 4	Within Near Zero range (F201) (ON)

◆ Weighing Mode 5 – Packer Mode 2(F223 – 05)

– 3-stage Control



Weight Setting

SP1	SP2	SP3	SP4
Target	Drib	Bulk	Free fall

Time

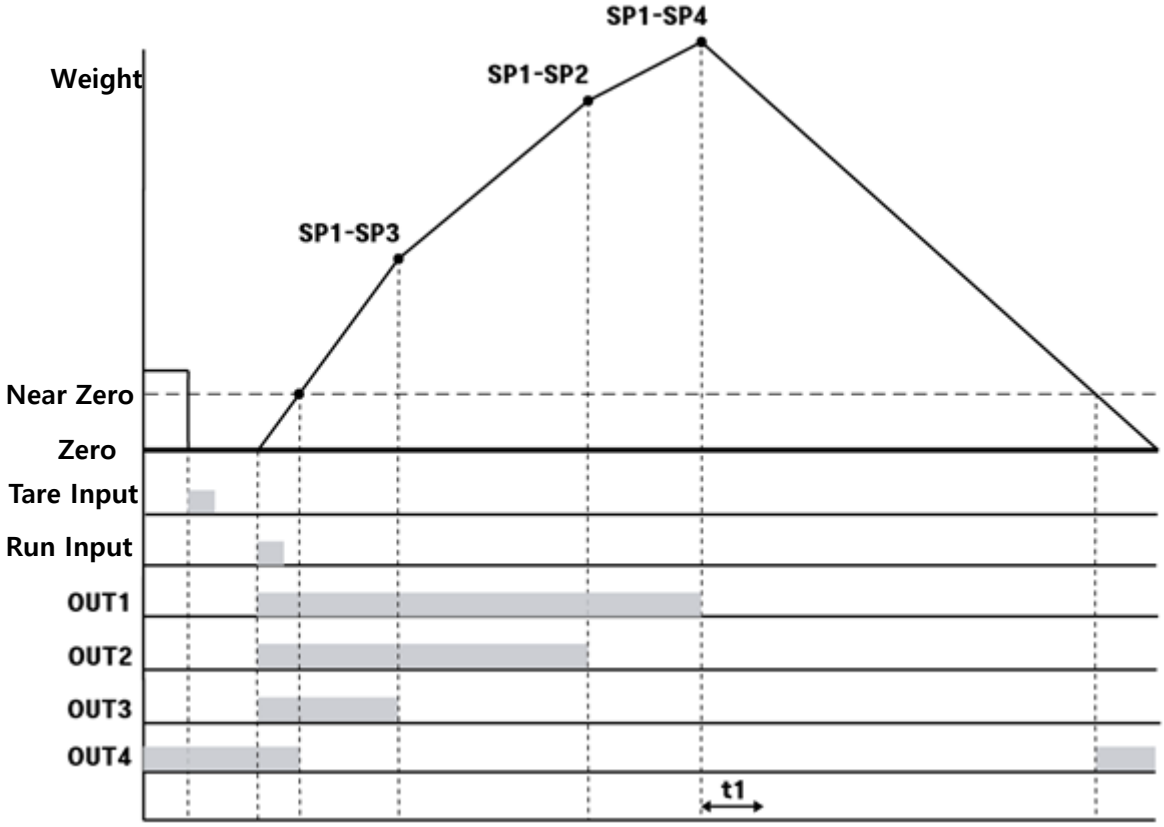
Time	Content
t1	Finish Relay Delay Time (F239) In the case of F103-3 or F103-6, save the date after t1 time.
t2	Finish Relay Output Delay Time (F240)

Relay Out

Relay	Contents	Relay	Contents
OUT 1	“START”(ON) Current weight ≥ SP1-SP4(OFF)	OUT 2	“START”(ON) Current weight ≥ SP1-SP2(OFF)
OUT 3	“START”(ON) Current weight ≥ SP1-SP3(OFF)	OUT 4	Current weight ≥ SP1-SP4 After t1 during t2 (ON)

◆ Weighing Mode 6 – Packer Mode 3(F223 – 06)

- 3-stage control



Weight Setting

SP1	SP2	SP3	SP4
Target	Drib	Bulk	Free fall

Time

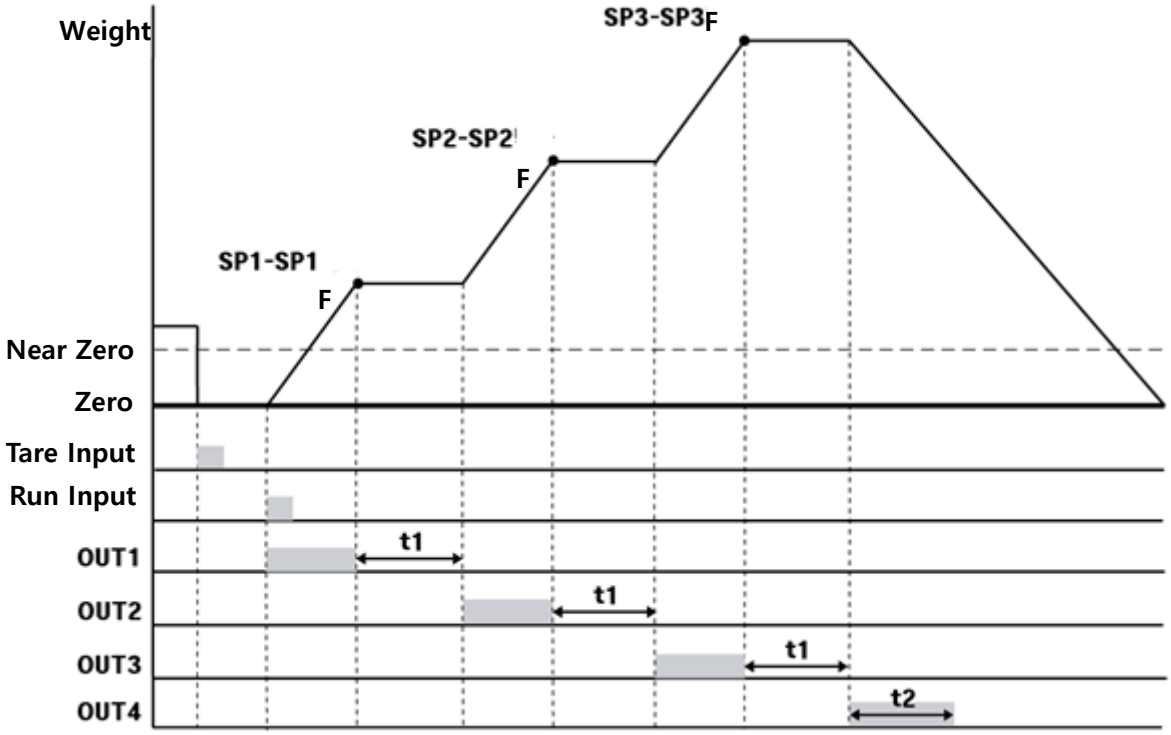
Time	Content
t1	Finish Relay Delay Time (F239) In the case of F103-3 or F103-6, save the date after t1 time.

Relay Out

Relay	Condition	Relay	Condition
OUT 1	Input Run (ON) Current weight ≥ SP1 – SP4 (OFF)	OUT 2	Input Run (ON) Current weight ≥ SP1 – SP2 (OFF)
OUT 3	Input Run (ON) Current weight ≥ SP1 – SP3 (OFF)	OUT 4	Within Near Zero range (HF11) (ON)

◆ Weighing Mode 7 – Accumulation mode 1 (F70-07)

- 3-stage control



Time

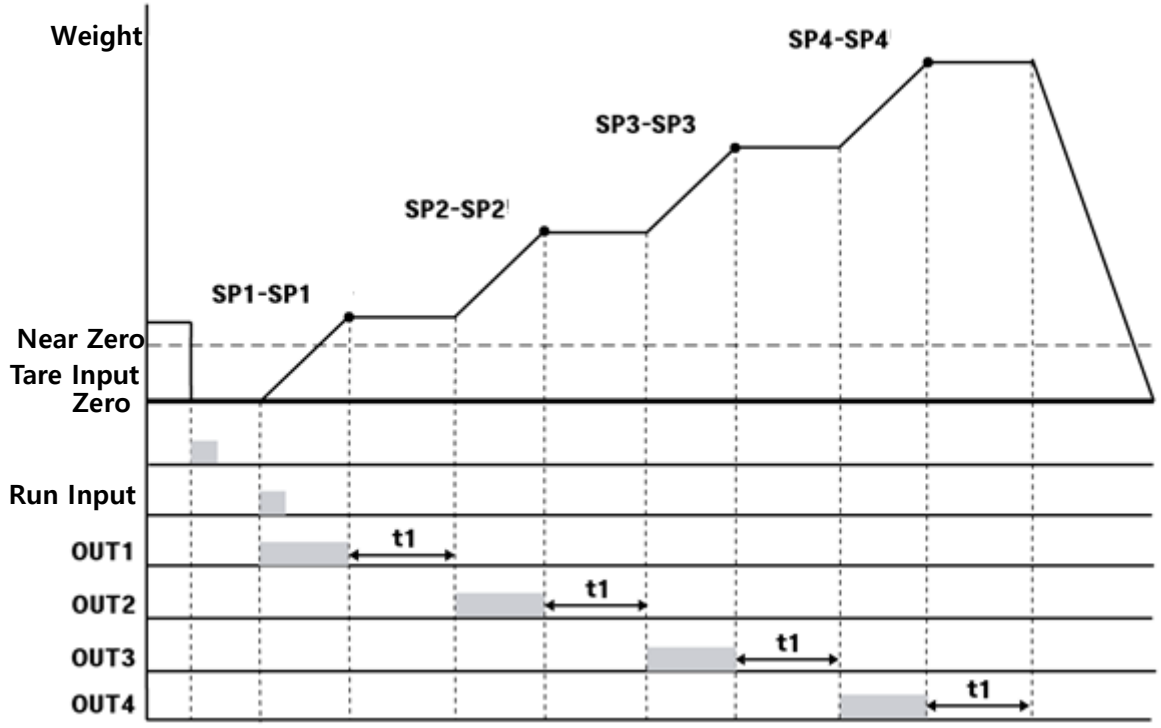
Time	Content
t1	Finish Relay Delay Time (F239) In the case of F103-3 or F103-6, save the date after t1 time.
t2	Finish Relay Output Delay Time (F240)

Relay Out

Relay	Condition	Relay	Condition
OUT 1	Input Run (ON) Current weight ≥ SP1 – SP1F (OFF)	OUT 2	Current weight < SP2 – SP2F (ON) Current weight ≥ SP2 – SP2F (OFF)
OUT 3	Current weight < SP3 – SP3F (ON) Current weight ≥ SP3 – SP3F (OFF)	OUT 4	Current weight ≥ SP3 – SP3F After t1, During t2 (ON)

◆ Weighing Mode 8 – Accumulation mode 2 (F70-08)

-4-stage control



Time

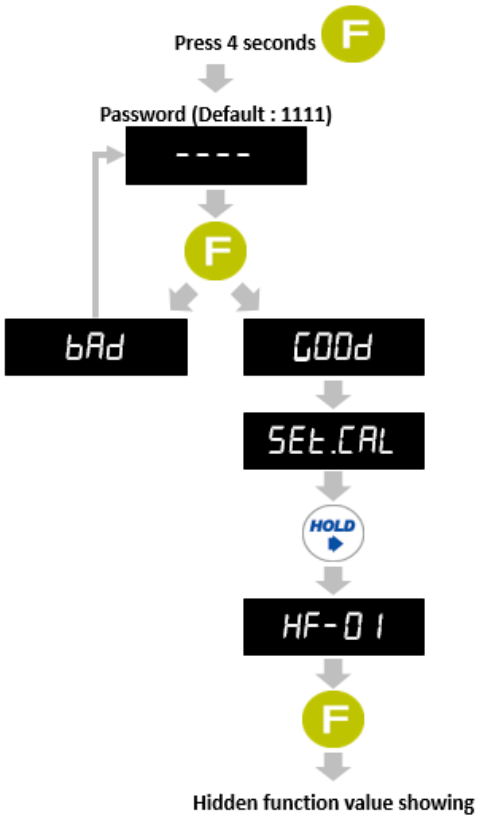
Time	Content
t1	Finish Relay Delay Time (F239) In the case of F103-3 or F103-6, save the date after t1 time.

Relay Out

Relay	Condition	Relay	Condition
OUT 1	Current weight ≥ SP1 – SP1F (ON) Current weight < SP1 – SP1F (OFF)	OUT 2	Current weight ≥ SP2 – SP2F (ON) Current weight < SP2 – SP2F (OFF)
OUT 3	Current weight ≥ SP3 – SP3F (ON) Current weight < SP3 – SP3F (OFF)	OUT 4	Current weight ≥ SP4 – SP4F (ON) Current weight < SP4 – SP4F (OFF)

◆ 5-3-3. Hidden function

※ How to enter hidden function mode



<Password input key>

- TARE : Number 1
- HOLD : Number 2
- PRINT : Number 3

<Other keys>

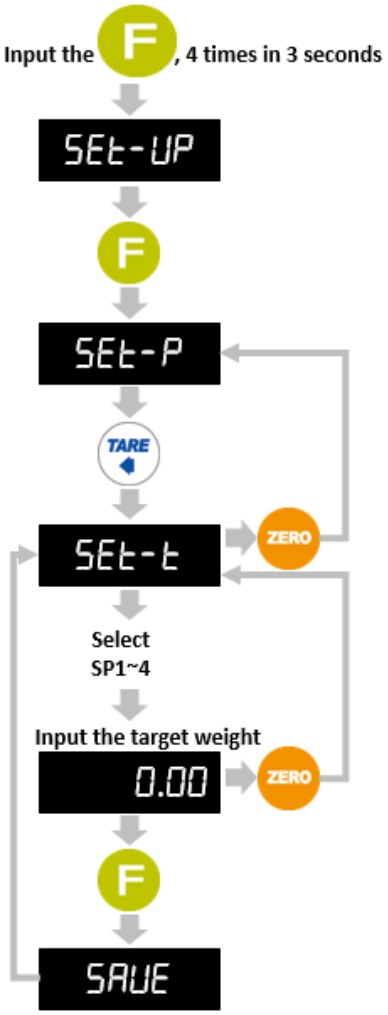
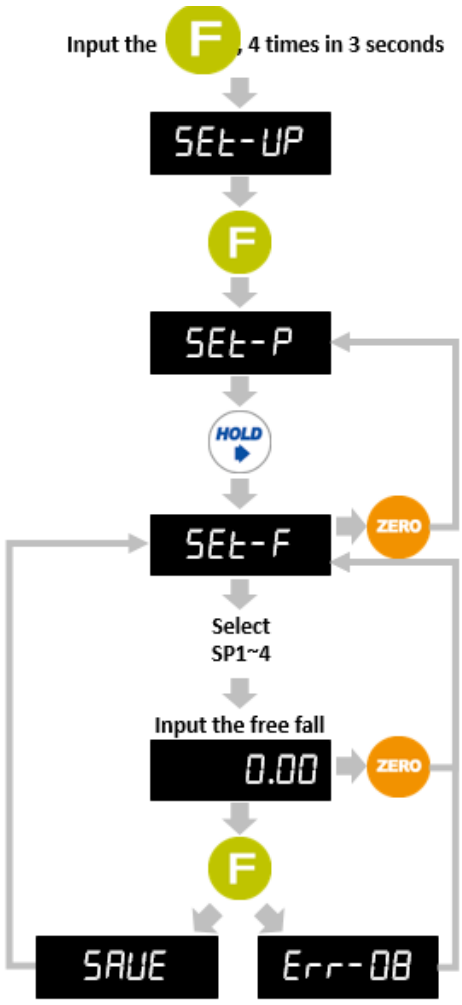
- PRINT : Increase the number
- F : Enter the function mode / Save
- ZERO : Cancel and previous step

No.	Subject	Default	Content
HF01	Serial Number	xxxxx	Factory release number
HF03	Software Version	Ver 4.00	
HF04	Hardware Version	Ver 3.00	
HF05	Date	YY.MM.DD	Able to set using keys
HF06	Time	HH.MM.SS	Able to set using keys
HF07	Password Setting - Password setting for Hidden Function Mode (4 digits) - Input password 2 times to check	----	TARE HOLD PRINT 1 2 3 Password can be combined with number 1~3.
HF08	Max Capacity	15.000	Change after calibration

No.	Subject	Default	Content
HF12	Span Constant	x.xxxxx	Use the F to back
HF13	Analog Output Setting	00	00 : Iout(4-20mA) 01 : Vout(0-10V)
HF14	Minimum Analog Output Adjustment (Current/Voltage)	0.000	Input ±gap value
HF15	Maximum Analog Output Adjustment (Current/Voltage)	0.000	Input ±gap value
HF16	Function Reset	FUNSET	Select between TARE for "NO" or HOLD for "Yes", then press F
HF17	Span Value Input	OrnU	Input Span Value with calibrator
HF18	Simulation Calibration Constant Value		F to back to previous step
HF19	Factory Reset	ALLSET	Select between TARE for "NO" or HOLD for "Yes", then press F
HF20	Program Download Mode		
HF21	Modbus Compatibility mode	00	00 : disuse 01 : use
HF39	Use Simulation Calibration	1	00 : disuse 01 : use

5-4. SP and Free fall setting

5-4-1. How to enter SP setting menu and set

SP1, SP2, SP3, SP4 (Set point)	Free fall
	

- TARE : SP1 or Move to the left
- HOLD : SP2 or Move to the right
- PRINT : SP3 or Increase Setting value
- F : SP4 or Save
- ZERO : Cancel

※ Free fall cannot be over its SP value, Err-08 will display if conditions are met.

※ Default value is “0”.

5-5. Test mode

Caution Disconnect all of the devices from the indicator before you proceed with test.

How to enter the test mode

1) Press F 4 times and SEt-UP displays
2) Press HOLD for Test mode 1 or PRINT for Test mode 2.
3) tESt means you succeeded to enter the test mode.
4) User can check indicators conditions use the below keys.

Key	Test mode 1	Test mode 2
TARE	Load Cell Input Value Fluctuation Check Mode	External Input Check Mode
HOLD	Display Check Mode	Relay Out Check Mode
PRINT	Keypad Check Mode	Serial Interface Com 1 Check Mode
F	Analog Output (4~20mA / 0~10V)	Serial Interface Com 2 Check Mode

5) Press ZERO to go back or cancel.

5-5-1. Load Cell Input Value Fluctuation Check Mode

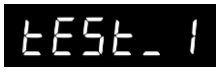
1) Press TARE on the test mode 1, then Digital value which is converted Analog Input value displays.
2) In this condition, press TARE and  will display.
   In this condition, the weight loaded on the scale part converted to digital value so you can check the deviation of change of weight.
3) Press HOLD (100 thounsand unit), PRINT (1 million unit) or F (10 million unit) to check load cell input value fluctuation check mode.
4) Press ZERO to go back to 

5-5-2. Display Check Mode

1) Press HOLD to make display flicker.
2) You can check display condition.
3) Press ZERO to go back to 

5-5-3. Keypad Check Mode

You can check key operation on display.

1) In test mode 1 press the PRINT key, display shows  .
2) When you push a key except for ZERO, relevant numbers will show up on display.
3) Press ZERO to go back to 

KEY	DISPLAY	KEY	DISPLAY
TARE	1	HOLD	2
PRINT	3	F	4

5-5-4. Analog Output 4~20mA, 0~10V Check Mode

1) Press F on Test mode 1 to make  display.
2) You can proceed with simulation With indicator outputting virtual analog output from In00.000(0mA, 0V) to 23.000(23mA, 10V).
3) A means Analog output 4 ~ 20mA, V means 0 ~ 10V.
4) Press ZERO to go back to 

※ You can check analog output by 0.1 unit with arrow keys.
If input value is over the maximum, real output will be 100%.
EX) **If** the mode is 4~20mA and you input **4.000,** the real output will be **4mA.**
If the mode is 4~20mA and you input **20.000,** the real output will be **20mA.**
If the mode is 0~10V and you input **4.700,** the real output will be **4.7V.**
If the mode is 0~10V and you input **10.000,** the real output will be **10V.**

5-5-5. External Input Check Mode

1) Press TARE on Test mode 2.
2) When  displays, wire External Input terminal (I1~I2) and Input Common Terminal(IC) to check External Input number on display.
3) Press ZERO to go back to  .

5-5-6. Relay Output Check Mode

1) Press HOLD on Test mode 2, then 
2) You can test relay outputs sequentially or particular relay you choose.
※ Disconnect all of the devices from indicator before you proceed with tests.

TARE	HOLD	PRINT	F
OUT1 ON/OFF	OUT2 ON/OFF	OUT3 ON/OFF	OUT4 ON/OFF

3) Press ZERO to go back to  .

5-5-7. Serial Interface Com 1 Check Mode

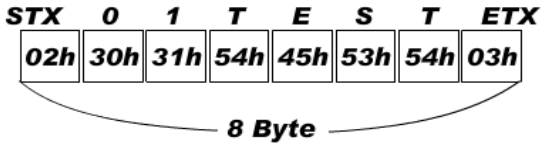
1) Press PRINT on Test mode 2, Conn_1 will display.
2) Connect Indicator to equipment which is Serial Interface available like PC.
3) Press any key except for ZERO to send arbitrary protocol to connected device.
4) LED flicker 1 time after reception.
5) Press ZERO to go back to tESt_2.

5-5-8. Serial Interface Com 2 Check Mode

1) Press F on Test mode 2, Conn_2 will display.
2) Connect Indicator to equipment which is Serial Interface available like PC.
3) Press any key except for ZERO to send arbitrary protocol to connected device.
4) LED flicker 1 time after reception.
5) Press ZERO to go back to tESt_2.

※ Test protocol

ID number



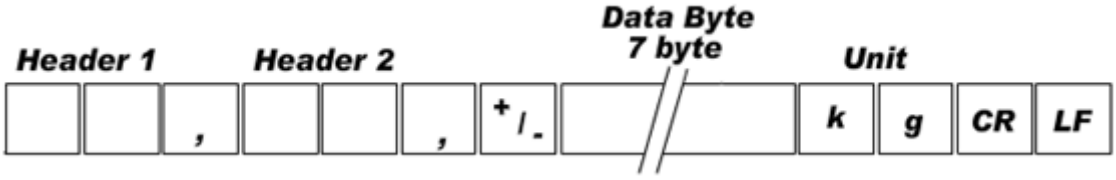
Caution

Serial port COM1 and COM2 cannot be tested at the same time.

6. Communication Data Format

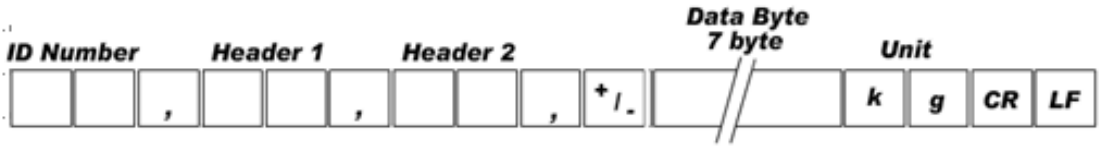
6-1. Stream Mode

6-1-1. Format 1 (excluding ID number) – 18 byte



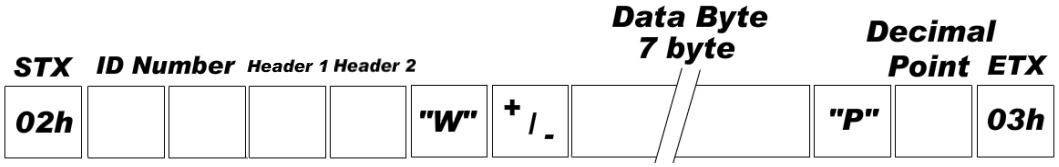
Classification	Contents
Header1 (2Byte)	OL : Overloaded ST : Stable US : Unstable
Header2 (2Byte)	NT : NET-WEIGHT GS : GROSS-WEIGHT
Sign (1Btye)	Mark
Weight Data (7Byte)	Current weight
UNIT (2Byte)	kg - k g g - g ton- t
CR (1byte)	Carriage Return
LF (1byte)	Line Feed
Example	ASCII : ST,NT,+0000.00kg CR LF HEX : 53h 54h 2Ch 4Eh 54h 2Ch 2Bh 30h 30h 30h 30h 2Eh 30h 30h 6Bh 67h 0Dh 0Ah

6-1-2. Format 2 (including ID number) – 21 byte



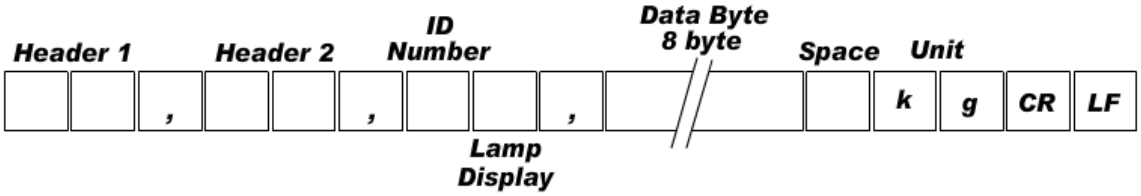
Classification	Contents
ID Number (2Byte)	ID number
Header1 (2Byte)	OL : Overloaded ST : Stable US : Unstable
Header2 (2Byte)	NT : NET-WEIGHT GS : GROSS-WEIGHT
Sign (1Btye)	Mark
Weight Data (7Byte)	Sign
UNIT (2Byte)	kg - k g g - g ton- t
CR (1byte)	Carriage Return
LF (1byte)	Line Feed
Example	ASCII : 01,ST,NT,+0000.00kg CR LF HEX : 30h 31h 2Ch 53h 54h 2Ch 4Eh 54h 2Ch 2Bh 30h 30h 30h 30h 2Eh 30h 30h 6Bh 67h 0Dh 0Ah

6-1-3. Format 3 (Including ID number) – 17 byte



Classification	Contents
STX (1Byte)	Start of Text
ID Number (2Byte)	
Header1 (1Byte)	O : Overloaded S : Stable U : Unstable
Header2 (1Byte)	N : NET-WEIGHT G : GROSS-WEIGHT
“W” (1Byte)	Current weight separator
Sign (1Btye)	Mark
Weight Data (7Byte)	Current weight
“P” (1Byte)	Decimal point separator
Decimal Point (1Byte)	
ETX (1Byte)	End of Text
Example	ASCII : STX 01SNW+0000000P2 ETX HEX : 02h 30h 31h 53h 4Eh 57h 2Bh 30h 30h 30h 30h 30h 30h 30h 30h 50h 32h 03h

6-1-4. Format 4 (including ID number) – 22 byte

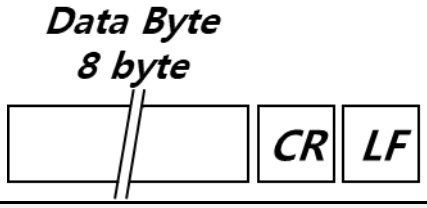


Classification	Contents
Header1 (2Byte)	OL : Overloaded ST : Stable US : Unstable
Header2 (2Byte)	NT : NET-WEIGHT GS : GROSS-WEIGHT
ID Number (1Byte)	ID number
Lamp Display (1Byte)	Lamp status display
Weight Data (8Byte)	Current weight including mark (Mark for minus '-' only)
UNIT (2Byte)	kg : kg g : g t : ton
CR (1byte)	Carriage Return
LF (1byte)	Line Feed
Example	ASCII : ST,NT,.?␣␣␣␣0.12 kg CR LF HEX : 53h 54h 2Ch 4Eh 54h 2Ch 01h E1h 2Ch 20h 20h 20h 20h 30h 2Eh 31h 32h 20h 6Bh 67h 0Dh 0Ah

※ Explanation of State Lamp Display

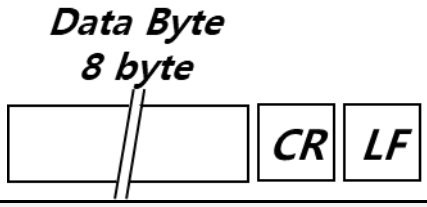
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	Steady	1	Hold	Print	Gross weight	Tare	Zero

6-1-5. Format 5 – 10 byte



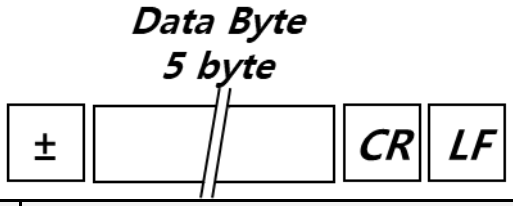
Classification	Contents
Weight Data (8Byte)	Current weight including decimal point and mark (Mark for minus '-' only)
CR (1byte)	Carriage Return
LF (1byte)	Line Feed
Example	ASCII : ␣␣␣␣0.12 CR LF HEX : 20h 20h 20h 20h 30h 2Eh 31h 32h 0Dh 0Ah ASCII : —␣␣␣0.12 CR LF HEX : 2Dh 20h 20h 20h 30h 2Eh 31h 32h 0Dh 0Ah

6-1-6. Format 6 – 10 byte



Classification	Contents
Weight Data (8Byte)	Current weight including decimal point and mark
CR (1byte)	Carriage Return
LF (1byte)	Line Feed
Example	ASCII : +0123.45 CR LF HEX : 2Bh 30h 31h 32h 33h 2Eh 34h 35h 0Dh 0Ah ASCII : —0123.45 CR LF HEX : 2Dh 30h 31h 32h 33h 2Eh 34h 35h 0Dh 0Ah

6-1-7. Format 7 (excluding decimal point) – 8 byte



Classification	Contents
Sign (1Btye)	Mark for minus '-' only
Weight Data (5Byte)	Current weight
CR (1byte)	Carriage Return
LF (1byte)	Line Feed
Example	ASCII : ␣01234 CR LF HEX : 20h 30h 31h 32h 33h 34h 0Dh 0Ah ASCII : −01234 CR LF HEX : 2Dh 30h 31h 32h 33h 34h 0Dh 0Ah

6-2. Command Mode

Command judgement judge data 06h (ACK), 15h (NAK) and Error Code which starts with 02h(STX) and ends with 03h(ETX).

6-2-1. Read command

Current Weight (Displayed Weight)		
Transmit	Format : STX(1) ID(2) RCWT(4) ETX(1) ASCII : STX 01RCWT ETX HEX : 02h 30h 31h 52h 43h 57h 54h 03h	8 Byte
Respond	Format : STX(1) ID(2) RCWT(4) State1(1) State 2(1) P(1) Decimal point(1) Sign(1) Current weight(7) Unit(2) ETX(1) ASCII : STX 01RCWTSNP2+0012345kg ETX HEX : 02h 30h 31h 52h 43h 57h 54h 53h 4Eh 50h 32h 2Bh 30h 30h 31h 32h 33h 34h 35h 6Bh 67h 03h	22 Byte
	State 1: O(Overloaded), S(Steady), U(Unsteady) State 2: N(Net weight), G(Gross weight)	
Current Weight (Memory)		
Transmit	Format : STX(1) ID(2) RCWD(4) ETX(1) ASCII : STX 01RCWD ETX HEX : 02h 30h 31h 52h 43h 57h 44h 03h	8 Byte
Respond	Format : STX(1) ID(2) RCWD(4) P(1) Decimal point(1) Date(6) Time(6) Part no.(2) Weighing Count(6) Sign(1) Tare weight(7) Sign(1) Current weight(7) Unit(2) ETX(1) ASCII : STX 01RCWDP21711011230350101234 5+0123456+0123456kg ETX HEX : 02h 30h 31h 52h 43h 57h 44h 50h 32h 31h 37h 31h 31h 30h 31h 31h 32h 33h 30h 33h 35h 30h 31h 30h 31h 32h 33h 34h 35h 2Bh 30h 31h 32h 33h 34h 35h 36h 2Bh 30h 31h 32h 33h 34h 35h 36h 6Bh 67h 03h	48 Byte

Sub-total		
Transmit	Format : STX(1) ID(2) RSUB(4) ETX(1) ASCII : STX 01RSUB ETX HEX : 02h 30h 31h 52h 53h 55h 42h 03h	8 Byte
Respond	Format : STX(1) ID(2) RSUB(4) P(1) Decimal point(1) Part no.(2) Sub-total count(6) Sub-total weight(10) Unit(2) ETX(1) ASCII : STX 01RSUBP201012345012345678 9kg ETX HEX : 02h 30h 31h 52h 53h 55h 42h 50h 32h 30h 31h 30h 31h 32h 33h 34h 35h 30h 31h 32h 33h 34h 35h 36h 37h 38h 39h 6Bh 67h 03h	30 Byte
Total		
Transmit	Format : STX(1) ID(2) RGRD(4) ETX(1) ASCII : STX 01RGRD ETX HEX : 02h 30h 31h 52h 47h 52h 44h 03h	8 byte
Respond	Format : STX(1) ID(2) RGRD(4) P(1) Decimal point(1) Total횟수(6) Total weight(10) Unit(2) ETX(1) ASCII : STX 01RGRDP20123450123456789kg ETX HEX : 02h 30h 31h 52h 47h 52h 44h 50h 32h 30h 31h 32h 33h 34h 35h 30h 31h 32h 33h 34h 35h 36h 37h 38h 39h 6Bh 67h 03h	28 byte
Time		
Transmit	Format : STX(1) ID(2) RTIM(4) ETX(1) ASCII : STX 01RTIM ETX HEX : 02h 30h 31h 52h 54h 49h 4Dh 03h	8 Byte
Respond	Format : STX(1) ID(2) RTIM(4) Time(6) ETX(1) ASCII : STX 01RTIM123035 ETX HEX : 02h 30h 31h 52h 54h 49h 4Dh 31h 32h 33h 30h 33h 35h 03h	14 Byte
Date		
Transmit	Format : STX(1) ID(2) RDAT(4) ETX(1) ASCII : STX 01RDAT ETX HEX : 02h 30h 31h 52h 44h 41h 54h 03h	8 Byte
Respond	Format : STX(1) ID(2) RDAT(4) Date(6) ETX(1) ASCII : STX 01RDAT171101 ETX HEX : 02h 30h 31h 52h 44h 41h 54h 31h 37h 31h 31h 30h 31h 03h	14 Byte

Tare Weight		
Transmit	Format : STX(1) ID(2) RTAR(4) ETX(1) ASCII : STX 01RTAR ETX HEX : 02h 30h 31h 52h 54h 41h 52h 03h	8 Byte
Respond	Format : STX(1) ID(2) RTAR(4) P(1) Decimal point(1) Sign(1) Tare weight(7) ETX(1) ASCII : STX 01RTARP2+0123456 ETX HEX : 02h 30h 31h 52h 54h 41h 52h 50h 32h 2Bh 30h 31h 32h 33h 34h 35h 36h 03h	18 Byte
Finish Value		
Transmit	Format : STX(1) ID(2) RFIN(4) ETX(1) ASCII : STX 01RFIN ETX HEX : 02h 30h 31h 52h 46h 49h 4Eh 03h	8 Byte
Respond	Format : STX(1) ID(2) RFIN(4) P(1) Decimal point(1) Sign(1) Finish Value(7) ETX(1) ASCII : STX 01RFINP2+0123456 ETX HEX : 02h 30h 31h 52h 46h 49h 4Eh 50h 32h 2Bh 30h 31h 32h 33h 34h 35h 36h 03h	18 Byte
SP1		
Transmit	Format : STX(1) ID(2) RSP1(4) ETX(1) ASCII : STX 01RSP1 ETX HEX : 02h 30h 31h 52h 53h 50h 31h 03h	8 Byte
Respond	Format : STX(1) ID(2) RSP1(4) P(1) Decimal point(1) SP1(7) ETX(1) ASCII : STX 01RSP1P20123456 ETX HEX : 02h 30h 31h 52h 53h 50h 31h 50h 32h 30h 31h 32h 33h 34h 35h 36h 03h	17 Byte

SP2		
Transmit	Format : STX(1) ID(2) RSP2(4) ETX(1) ASCII : STX 01RSP2 ETX HEX : 02h 30h 31h 52h 53h 50h 32h 03h	8 Byte
Respond	Format : STX(1) ID(2) RSP2(4) P(1) Decimal point(1) SP2(7) ETX(1) ASCII : STX 01RSP2P20123456 ETX HEX : 02h 30h 31h 52h 53h 50h 32h 50h 32h 30h 31h 32h 33h 34h 35h 36h 03h	17 Byte
SP3		
Transmit	Format : STX(1) ID(2) RSP3(4) ETX(1) ASCII : STX 01RSP3 ETX HEX : 02h 30h 31h 52h 53h 50h 33h 03h	8 Byte
Respond	Format : STX(1) ID(2) RSP3(4) P(1) Decimal point(1) SP3(7) ETX(1) ASCII : STX 01RSP3P20123456 ETX HEX : 02h 30h 31h 52h 53h 50h 33h 50h 32h 30h 31h 32h 33h 34h 35h 36h 03h	17 Byte
SP4		
Transmit	Format : STX(1) ID(2) RSP4(4) ETX(1) ASCII : STX 01RSP4 ETX HEX : 02h 30h 31h 52h 53h 50h 34h 03h	8 Byte
Respond	Format : STX(1) ID(2) RSP4(4) P(1) Decimal point(1) SP4(7) ETX(1) ASCII : STX 01RSP4P20123456 ETX HEX : 02h 30h 31h 52h 53h 50h 34h 50h 32h 30h 31h 32h 33h 34h 35h 36h 03h	17 Byte
SP1, SP2, SP3, SP4		
Transmit	Format : STX(1) ID(2) RSPA(4) ETX(1) ASCII : STX 01RSPA ETX HEX : 02h 30h 31h 52h 53h 50h 41h 03h	8 Byte
Respond	Format : STX(1) ID(2) RSPA(4) P(1) Decimal point(1) SP1(7) SP2(7) SP3(7) SP4 (7) ETX(1) ASCII : STX 01RSPAP2012345601234560123456012345 6 ETX HEX : 02h 30h 31h 52h 53h 50h 41h 50h 32h 30h 31h 32h 33h 34h 35h 36h 30h 31h 32h 33h 34h 35h 36h 30h 31h 32h 33h 34h 35h 36h 30h 31h 32h 33h 34h 35h 36h 03h	38 Byte

Current Weight, INPUT, OUTPUT		
Transmit	Format : STX(1) ID(2) RWRS(4) ETX(1) ASCII : STX 01RWRS ETX HEX : 02h 30h 31h 52h 57h 52h 53h 03h	8 Byte
Respond	Format : STX(1) ID(2) RWRS(4) P(1) Decimal point(1) Sign(1) Current weight(7) INPUT(4) Relay out(4) ETX(1) ASCII : STX 01RWRSP2+012345600000000 ETX HEX : 02h 30h 31h 52h 57h 52h 53h 50h 32h 2Bh 30h 31h 32h 33h 34h 35h 36h 30h 30h 30h 30h 30h 30 30 30 03h	26 Byte

6-2-2. Write Command

-Transmit (Normal): STX + ID(2Byte) + ACK + ETX

-Transmit (Error): STX + ID(2Byte) + NAK + ETX

Zero Setting					
Transmit	Format : STX(1) ID(2) WZER(4) ETX(1) ASCII : STX 01WZER ETX HEX : 02h 30h 31h 57h 5Ah 45h 52h 03h				8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte
Tare Setting					
Transmit	Format : STX(1) ID(2) WTAR(4) ETX(1) ASCII : STX 01WTAR ETX HEX : 02h 30h 31h 57h 54h 41h 52h 03h				8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte
Tare Reset					
Transmit	Format : STX(1) ID(2) WTRS(4) ETX(1) ASCII : STX 01WTRS ETX HEX : 02h 30h 31h 57h 54h 52h 53h 03h				8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte
Hold Setting					
Transmit	Format : STX(1) ID(2) WHOL(4) ETX(1) ASCII : STX 01WHOL ETX HEX : 02h 30h 31h 57h 48h 4Fh 4Ch 03h				8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX	5 Byte

		HEX : 02h 30h 31h 06h 03h		HEX : 02h 30h 31h 15h 03h	
Hold Reset					
Transmit	Format : STX(1) ID(2) WHRS(4) Part no.(2) ETX(1) ASCII : STX 01WHRS ETX HEX : 02h 30h 31h 57h 48h 52h 53h 03h				8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte
Print					
Transmit	Format : STX(1) ID(2) WPRT(4) ETX(1) ASCII : STX 01WPRT ETX HEX : 02h 30h 31h 57h 50h 52h 54h 03h				8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte
Print Sub-total					
Transmit	Format : STX(1) ID(2) WSPR(4) ETX(1) ASCII : STX 01WSPR ETX HEX : 02h 30h 31h 57h 53h 50h 52h 03h				8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte
Print Total					
Transmit	Format : STX(1) ID(2) WGPR(4) ETX(1) ASCII : STX 01WGPR ETX HEX : 02h 30h 31h 57h 47h 50h 52h 03h				8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte

Delete Sub-total					
Transmit	Format : STX(1) ID(2) WSTC(4) ETX(1) ASCII : STX 01WSTC ETX HEX : 02h 30h 31h 57h 53h 54h 43h 03h				8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte
Delete Total					
Transmit	Format : STX(1) ID(2) WGTC(4) ETX(1) ASCII : STX 01WGTC ETX HEX : 02h 30h 31h 57h 47h 54h 43h 03h				8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte
Run					
Transmit	Format : STX(1) ID(2) WSTR(4) ETX(1) ASCII : STX 01WSTR ETX HEX : 02h 30h 31h 57h 53h 54h 52h 03h				8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte
Stop					
Transmit	Format : STX(1) ID(2) WSTP(4) ETX(1) ASCII : STX 01WSTP ETX HEX : 02h 30h 31h 57h 53h 54h 50h 03h				8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte

<table>
<tr><th colspan="6">Time Setting</th></tr>
<tr><td>Transmit</td><td colspan="4">Format : STX(1) ID(2) WTIM(4) TIME(6) ETX(1)
ASCII : STX 01WTIM123035 ETX
HEX : 02h 30h 31h 57h 54h 49h 4Dh 31h 32h 33h 30h 33h 35h 03h</td><td>14 Byte</td></tr>
<tr><td>Respond</td><td>Normal</td><td>Format : STX(1) ID(2) ACK(1) ETX(1)
ASCII : STX 01 ACK ETX
HEX : 02h 30h 31h 06h 03h</td><td>Error</td><td>Format : STX(1) ID(2) NAK(1) ETX(1)
ASCII : STX 01 NAK ETX
HEX : 02h 30h 31h 15h 03h</td><td>5 Byte</td></tr>
<tr><th colspan="6">Date Setting</th></tr>
<tr><td>Transmit</td><td colspan="4">Format : STX(1) ID(2) WDAT(4) DATE(6) ETX(1)
ASCII : STX 01WDAT171101 ETX
HEX : 02h 30h 31h 57h 44h 41h 54h 31h 37h 31h 31h 30h 31h 03h</td><td>14 Byte</td></tr>
<tr><td>Respond</td><td>Normal</td><td>Format : STX(1) ID(2) ACK(1) ETX(1)
ASCII : STX 01 ACK ETX
HEX : 02h 30h 31h 06h 03h</td><td>Error</td><td>STX(1) ID(2) NAK(1) ETX(1)
ASCII : STX 01 NAK ETX
HEX : 02h 30h 31h 15h 03h</td><td>5 Byte</td></tr>
<tr><th colspan="6">SP1</th></tr>
<tr><td>Transmit</td><td colspan="4">Format : STX(1) ID(2) WSP1(4) SP1(7) ETX(1)
ASCII : STX 01WSP10123456 ETX
HEX : 02h 30h 31h 57h 53h 50h 31h 30h 31h 32h 33h 34h 35h 36h 03h</td><td>15 Byte</td></tr>
<tr><td>Respond</td><td>Normal</td><td>Format : STX(1) ID(2) ACK(1) ETX(1)
ASCII : STX 01 ACK ETX
HEX : 02h 30h 31h 06h 03h</td><td>Error</td><td>Format : STX(1) ID(2) NAK(1) ETX(1)
ASCII : STX 01 NAK ETX
HEX : 02h 30h 31h 15h 03h</td><td>5 Byte</td></tr>
<tr><th colspan="6">SP2</th></tr>
<tr><td>Transmit</td><td colspan="4">Format : STX(1) ID(2) WSP2(4) SP2(7) ETX(1)
ASCII : STX 01WSP20123456 ETX
HEX : 02h 30h 31h 57h 53h 50h 32h 30h 31h 32h 33h 34h 35h 36h 03h</td><td>15 Byte</td></tr>
<tr><td>Respond</td><td>Normal</td><td>Format : STX(1) ID(2) ACK(1) ETX(1)
ASCII : STX 01 ACK ETX
HEX : 02h 30h 31h 06h 03h</td><td>Error</td><td>Format : STX(1) ID(2) NAK(1) ETX(1)
ASCII : STX 01 NAK ETX
HEX : 02h 30h 31h 15h 03h</td><td>5 Byte</td></tr>
</table>

<table>
<tr><th colspan="6">SP3</th></tr>
<tr><td>Transmit</td><td colspan="4">Format : STX(1) ID(2) WSP3(4) SP3(7) ETX(1)
ASCII : STX 01WSP30123456 ETX
HEX : 02h 30h 31h 57h 53h 50h 33h 30h 31h 32h 33h 34h 35h 36h 03h</td><td>15 Byte</td></tr>
<tr><td>Respond</td><td>Normal</td><td>Format : STX(1) ID(2) ACK(1) ETX(1)
ASCII : STX 01 ACK ETX
HEX : 02h 30h 31h 06h 03h</td><td>Error</td><td>Format : STX(1) ID(2) NAK(1) ETX(1)
ASCII : STX 01 NAK ETX
HEX : 02h 30h 31h 15h 03h</td><td>5 Byte</td></tr>
<tr><th colspan="6">SP4</th></tr>
<tr><td>Transmit</td><td colspan="4">Format : STX(1) ID(2) WSP4(4) SP4(7) ETX(1)
ASCII : STX 01WSP40123456 ETX
HEX : 02h 30h 31h 57h 53h 50h 34h 30h 31h 32h 33h 34h 35h 36h 03h</td><td>15 Byte</td></tr>
<tr><td>Respond</td><td>Normal</td><td>Format : STX(1) ID(2) ACK(1) ETX(1)
ASCII : STX 01 ACK ETX
HEX : 02h 30h 31h 06h 03h</td><td>Error</td><td>Format : STX(1) ID(2) NAK(1) ETX(1)
ASCII : STX 01 NAK ETX
HEX : 02h 30h 31h 15h 03h</td><td>5 Byte</td></tr>
<tr><th colspan="6">SP1, SP2, SP3, SP4</th></tr>
<tr><td>Transmit</td><td colspan="4">Format : STX(1) ID(2) WSPA(4) SP1 (7) SP2(7) SP3(7) SP4(7) ETX(1)
ASCII : STX 01WSPA012345601234560123456012345 6 ETX
HEX : 02h 30h 31h 57h 53h 50h 34h 30h 31h 32h 33h 34h 35h 36h 30h 31h 32h 33h 34h 35h 36h 30h 31h 32h 33h 34h 35h 36h 30h 31h 32h 33h 34h 35h 36h 03h</td><td>36 Byte</td></tr>
<tr><td>Respond</td><td>Normal</td><td>Format : STX(1) ID(2) ACK(1) ETX(1)
ASCII : STX 01 ACK ETX
HEX : 02h 30h 31h 06h 03h</td><td>Error</td><td>Format : STX(1) ID(2) NAK(1) ETX(1)
ASCII : STX 01 NAK ETX
HEX : 02h 30h 31h 15h 03h</td><td>5 Byte</td></tr>
</table>

<table>
<tr><th colspan="6">Change SP1, SP2, SP3, SP4</th></tr>
<tr><td>Transmit</td><td colspan="4">Format : STX(1) ID(2) WFTD(4) Part no.(2) SP1 (7) SP2(7) SP3(7) SP4(7) ETX(1)
ASCII : STX 01WFTD01012345601234560123456012345 6 ETX
HEX : 02h 30h 31h 57h 46h 54h 44h 30h 31h 30h 31h 32h 33h 34h 35h 36h 30h 31h 32h 33h 34h 35h 36h 30h 31h 32h 33h 34h 35h 36h 30h 31h 32h 33h 34h 35h 36h 03h</td><td>38 Byte</td></tr>
<tr><td>Respond</td><td>Normal</td><td>Format : STX(1) ID(2) ACK(1) ETX(1)
ASCII : STX 01 ACK ETX
HEX : 02h 30h 31h 06h 03h</td><td>Error</td><td>Format : STX(1) ID(2) NAK(1) ETX(1)
ASCII : STX 01 NAK ETX
HEX : 02h 30h 31h 15h 03h</td><td>5 Byte</td></tr>
</table>

※ How to calculate CHECK SUM

Check sum is a remainder when Sum of HEX value of the data from STX to ETX and the value is into 100.

ex) The sum HEX value from STX to ETX(02,30,31,52,43,57,54,03) is 1A6h.
Then, divide 1A6h by 100h(1A6h/100h) and the remainder is A6h.
This value is converted to ASCII and transferred to 41(A) 36(6).
Command Judgement of Command mode judges and outputs 06h(ACK) and 15h(NAK), Error code between the data which starts with 02h(STX) and ends with 03h(ETX)

6-3. Modbus

- RO : Read Only
- RW : Read Write
- Setting value for Each Part Number cannot be over Max Capacity
  ex) If you want to set 35.00kg, input 3500 (0xDAC)
- Input 6 digits to set Date and Time
  ex) Input 140101 (0x22345) for 2014 January 1st
  Input 155017 (0x25D89) for 3:50:17 pm
- Refer to Memory Register Table below for lamp, error, digital input, standard key, special key.
- Modbus Function Codes
  '03' (0x03) : Read Holding Registers
  '04' (0x04) : Read Input Registers
  '06' (0x06) : Write Single Registers
  '16' (0x10) : Write Multiple Registers

6-3-1. Data Address Map

Contents	Address		Length	Feature
Date	115	0x73	2	R/W
Time	117	0x75	2	R/W
Max Capacity	141	0x8D	2	R
ADC value	145	0x91	2	R
Division	149	0x95	1	R
Decimal Point	150	0x96	1	R
Current Weight	151	0x97	2	R
Tare Weight	153	0x99	2	R
Measured Weight	157	0x9D	2	R
External Input	161	0xA1	1	R
Relay Out	163	0xA3	1	R
Lamp	164	0xA4	2	R
Error	166	0xA6	2	R
Weighing Mode	170	0xAA	1	R

Contents	Address		Length	Feature
Step	171	0xAB	1	R
Key	168	0xA8	1	R/W
SP1	172	0xAC	2	R/W
SP2	174	0xAE	2	R/W
SP3	176	0xB0	2	R/W
SP4	178	0xB2	2	R/W
SP1 Free Fall	180	0xB4	2	R/W
SP2 Free Fall	182	0xB6	2	R/W
SP3 Free Fall	184	0xB8	2	R/W
SP4 Free Fall	186	0xBA	2	R/W

6-3-2. External Input Data Map

1bit	2bit	3bit	4bit	5bit	6bit	7bit	8bit
IN 1	IN 2	IN 3	IN 4				

6-3-3. Lamp Data Map

1bit	2bit	3bit	4bit	5bit	6bit	7bit	8bit
Steady	Zero	Tare	OUT1	OUT2	OUT3	OUT4	HOLD

6-3-4. Key Data Map

0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08
Zero	Tare / Tare reset	Hold / Hold reset	Print		Run / Stop		
0x09	0x10	0x11	0x12	0x13	0x14	0x15	0x16
	Print	Tare	Tare reset	Hold	Hold reset	Run	Stop

6-3-5. Relay output register

1bit	2bit	3bit	4bit	5bit	6bit	7bit	8bit
OUT1	OUT2	OUT3	OUT4				

6-4. Print format

It can be connect the indicator to all kinds of Serial Interface printers, but recommend you to use SE7200, SE7300 (30 columns) since the print format is programmed and fixed with the models.

	Korean (111-00)	English (111-01)
Continuous F352-01	========== 날짜 : 2011-05-10 시간 : 18:00:10 장비번호 : 1 품번 : 10 순번 중량 1 1.330kg 2 5.350kg	========== DATE : 2011-05-10 TIME : 18:00:10 SERIAL No : 1 PART No : 20 COUNT WEIGHT 1 1.330kg 2 5.350kg
Single F352-00	========== 날짜 : 2011-05-10 시간 : 18:00:10 장비번호 : 1 품번 : 20 순번 중량 1 1.330kg ========== 날짜 : 2011-05-10 시간 : 18:00:10 장비번호 : 1 품번 : 20 순번 중량 2 5.350kg	========== DATE : 2011-05-10 TIME : 18:00:10 SERIAL No : 1 PART No : 20 COUNT WEIGHT 1 1.330kg ========== DATE : 2011-05-10 TIME : 18:00:10 SERIAL No : 1 PART No : 20 COUNT WEIGHT 2 5.350kg
Total	========== 총 계 날짜 : 2011-05-10 시간 : 18:00:10 장비번호 : 1 계량횟수 : 20 누적중량 : 258.145kg ========== 총계 삭제 ==========	========== TOTAL DATE : 2011-05-10 TIME : 18:00:10 SERIAL No : 1 TOTAL COUNT : 20 TOTAL WEIGHT : 258.145kg ========== TOTAL DELETE ==========

Date and Time will be printed when it is number first in spite of Continuous format setting.

7. Error and Treatment

7-1. Error during Load Cell Installation

Error	Causing	Treatment	Remark
Weight is unstable	1. Load cell broken 2. Load cell isolation resistance error 3. There is interruption on the weighing part 4. Summing board broken	1. Measure input/output resistance of Load cell. 2. Measure Load cell isolation resistance 3. Change Summing Board 4. Make sure that there is nothing on the scale part.	1. Input Resistance of “EXC+” and “EXC-“ is about 400Ω ±30 2. Output Resistance of “SIG+“ and “SIG-” is about 350Ω ±3.5 3. Isolate Resistance is more than 100MΩ
Weight increases regularly or does not returns to Zero.	1. Load cell error 2. Load cell connection Error	1. Check load cell connection 2. Measure resistance value of load cell	
Weight value is Minus (-)	1. Load cell Output wires (SIG+, SIG-) are switched	1. Check load cell connection	
“UnPAss" displays	1. Load cell broken or Indicator connection error	1. Check load cell 2. Check load cell connection	
	1. Power has been supplied when the scale part is not empty.	1. Remove weight on the load cell	
“OL" displays (OVER LOAD)	1. Load cell broken or Indicator connection Error 2. Weight over Max Capacity	1. Check load cell 2. Check load cell connection 3. Remove overloaded weight	

7-2. ERROR

Display	Cause
Err-01	The value of (Max Capacity/Division) is over 20,000.
Err-04	The balance weight is heavier than Max Capacity.
Err-05	The balance weight is lighter that 10% of Max Capacity.
Err-06	Amp and Gain are too big, Load cell cables (SIG+ / SIG-) are connected crossly, Did not load the balance weight
Err-07	Amp and Gain are too big, Load cell cables (SIG+ / SIG-) are connected crossly, Did not load the balance weight
Err-09	Input unavailable setting value
Err-10	The weight is not stable during calibration.

※ Er-06/07 mean it is impossible to calculate precise weight with the calibration information you input.

7-3. Error and treatment

Following error table shows causing of error and treatment, when weighing process is not working or it cannot measure weighing due to indicator error.

Display	Cause	Treatment
"Ad-Err or "0L"	1. Load cell broken 2. Load cell cable broken 3. Load cell connection Error 4. A/D Board Error 5. Analogue value over 1,040,000. ※ "OL" displays as well if the current value is over the absolute value of Max Capacity. Ex) Max Capacity is "100" and current weight is uner "-100" : "OL" shows up.	1. Check load cell input digital value on Test mode 1. If this value does not change, check load cell and connection condition first. 2. Check weight value error with another indicator. 3. Check A/D converting board error with another indicator. 4. Check Power cable 5. Check load cell terminal
"UnPAss"	1. Power has been supplied when the scale part is not empty. ※ F01-00 : "UnPAss" displays when power has been supplied though there is load of 10% of Max Capacity on the scale part. ※ F01-01 : Indicator saved previous zero value so it normally works with the load on the scale part not showing "UnPAss".	1. Make sure that the weighing part is empty before turn on the power. 2. Set F01-01(Back-up) so that the indicator can remember first empty value.
"HAlt"	"HAlt" on the display or continuous beep – Hard ware error	Please contact the distributor or the Head Office.

Warranty Certification

This product passed strict quality test of SEWHACNM Co., LTD.

If there is a defect of manufacturing or abnormal detection within warranty period, please contact our agent or distributor with this Warranty Certification so that you can get the product repaired or replaced.

Warranty Clause

1. The warranty period is one(1) year from your purchase date.

2. Warranty Exemption Clause

- Warranty period expired
- Mal-function caused by repairmen, modification, etc without any authorization of the Headquarter.
- Mal-function caused by user's carelessness
- Mal-function caused by distribution of non-authorized distributor or agent
- Mal-function cased since user did not follow the precautions.
- Mal-function or defection caused by Fore Majeur
- Without presentation of this Warranty Certification

3. Other

- Warranty Certification without authorized stamp is invalid.

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Made in KOREA

Product	Digital Weighing Indicator
Model	SI 580E
Serial No.	
AUTHORIZED STAMP