

Digital Weighing Indicator

Instruction Manual (FS-8000C)



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CHAPTER 1. PREFACE

1-1	INTRODUCE.....	4
1-2	SAFTY CONDITIONS.....	5
1-3	FEATURES.....	6
1-4	FRONT PANEL DESCRIPTION.....	7
	1-4-1 DISPLAY LAMP.....	7
	1-4-2 HOW TO USE KEY.....	9
1-5	REAR-SIDE PANEL.....	13
1-6	SPECIFICATION.....	16
1-7	HOW TO CONNECT TO EXTERNAL EQUIPMENT.....	18

CHAPTER 2. INSTALLATION

2-1	OUT-DIMMENSION & CUTTING SIZE.....	20
2-2	ASSEMBLE DRAWING.....	21
2-3	HOW TO CONNECT TO LOADCELL.....	22
2-4	ERROR & CLEAR.....	23

CHAPTER 3. CALIBRATION

3-1	ZERO ADJUSTMENT.....	24
3-2	SPAN ADJUSTMENT.....	24
3-3	ERROR MESSAGES & ADJUST.....	28

CHAPTER 4. SET-UP

4-1	PREFACE.....	33
4-2	SET-UP.....	33
4-3	F-FUNCTION SUMMARY LIST.....	35

CHAPTER 5. SET-UP FUNCTION

5-1	SET BASIC FUNCTION FOR WEIGHING.....	37
5-2	SET BASIC FUNCTION.....	40
5-3	SET SERIAL INTERFACE	47
5-3-1.	RS-232C SERIAL INTERFACE.....	49
5-3-2	CURRENT LOOP.....	52
5-4	SET ADDITIONAL FUNCTION.....	57
5-4-1	OP-03 BCD OUT.....	57
5-4-2	OP-04 RS-422/485 SERIAL INTERFACE.....	61
5-4-3	OP-05 ANALOG OUT(0~10V).....	62
5-4-4	OP-05 ANALOG OUT(4~20mA).....	64
5-4-5	OP-07 PRINTER.....	66
5-4-6	OP-10 BCD INPUT.....	71
5-4-6	OP-11 CH-A, CH-B Extension Serial I/F.....	72
5-5	EQUIPMENT ID NUMBER SET.....	76

CHAPTER 1. PREFACE

1-1. INTRODUCE

Thank you very much for your purchasing FINE Digital Weighing Indicator of **FS-8000C**. This Instruction Manual will make you lead to use **FS-8000C** with FINE speed, accuracy, reliability. **FS-8000C** is designed to withstand harsh environmental conditions and is designed for flawless Performance in your demanding application.

FS-8000C is Digital Weighing Indicator amplifying the analog output from a load Cell, converting the analog signal to digital data and then displaying this data as a weight reading And is designed for flawless performance in your demanding

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The Application of FS-8000C Model will be used for platform Scale, Truck Scale, Strain, Compression Tater in Industrial Factory which can indicate the correct material weight and totalized weight data.

Also, an additional option will make Modern Industry demand equipment that both versatile And available to easily connect to other devices

※ APPLICATION

1. PACKING EQUIPMENTS FOR MANUAL WEIGHING
2. EQUIPMENTS FOR PLATFORM, TANK, TRUCK SCALE
3. EQUIPMENTS FOR STRAIN/COMPRESSION TESTER
4. RECORD-MANAGEMENT FOR PRODUCT WEIGHT

☞ REMARK

- This Specification is subjected to change for improvement without prior notice.
- This Version Number will be increased as it graded up
- All function should be the same to the old version

1-2. SAFTY CONDITIONS

Please keep the following using conditions certainly

◆ EARTH

To avoid an electric error such as a noises in your production line

It should be earthed before installation certainly.

Specially it will be safety to supply the power of Indicator to the load cell.

◆ SAFTY CONDITIONS

Do not use it closed to a explosive gas and an inflammable dust environments

◆ POWER SUPPLY

Use the power under 110/220V 50/60HZ $\pm 10\%$ and isolate it from the main power.

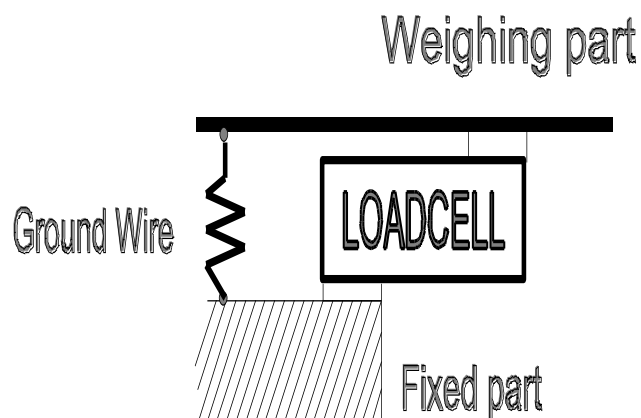
◆ Temperature Conditions.

OPERATING Temperature : $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$ ($+14^{\circ}$ to 104°F)

CUSTODY Temperature : $-40^{\circ}\text{C} \sim +80^{\circ}\text{C}$ (-40° to 176°F)

◆ Installation Load cell.

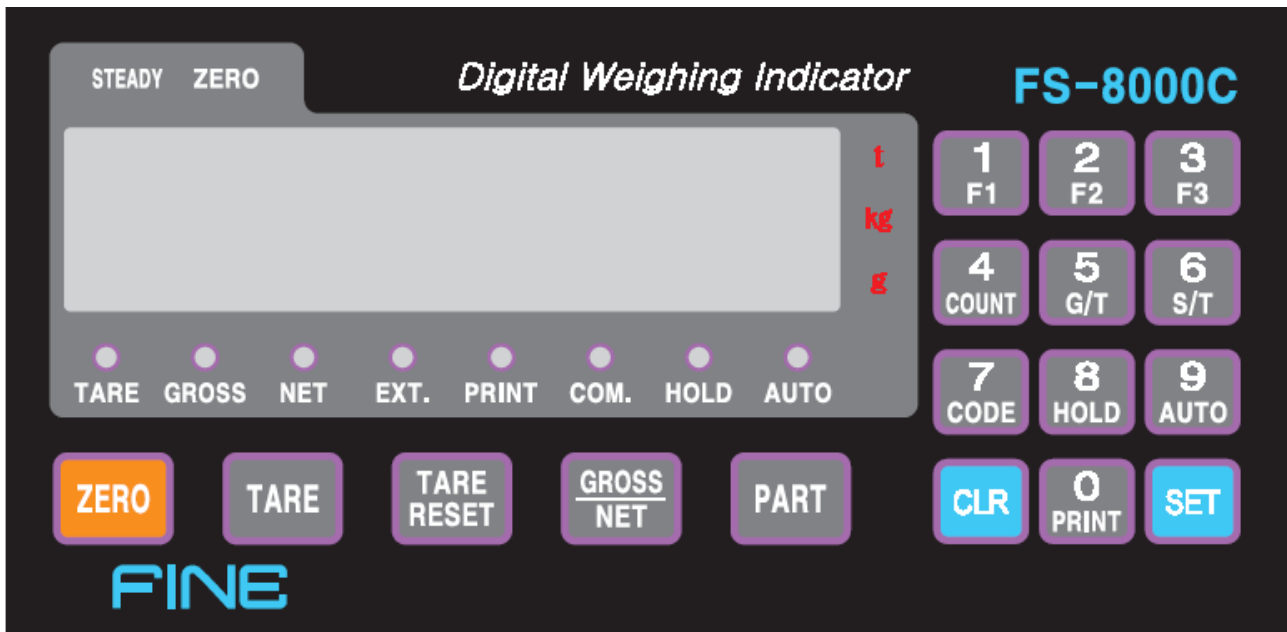
- Available to use the same load cell Until Max. 16pcs (300 Ω standard)
- A ground should be installed horizontal
- Installing over 2pcs of load cell and connect each line in parallel and
Insert a variable resistor under 50 Ω in EX + line and minimize a output Accuracy of load cell.
- It may occur a weight error by each accuracy of load cell.
- It may occur a weight error in case of a temperature variation of load cell
- Please weld(electric spark) at the place installed with load cell and equipments,
Isolate the power into a connector of load cell in inevitable case
- Please connect the below construction of load cell to avoid from electric spark.



1-3. FEATURES

- **A compact Appearance by DIN regulations (DIN 186 x 92 Panel Insertion)**
- **Set up to Max. 1/30,000 display resolution**
- **Function available to change the unit value such as kg, ton, lb, g**
(In case of Serial Interface & Printer)
- **It can track the based zero value without adjusting the DIP-Switch in Calibration**
- **Selectable A/D Conversion Speed(25,30,50,60,100,150,180,200,240 Times/Sec)**
(SET UP F94)
- **Available to use the interface of 3kinds of Interface in 1pcs Interface Card**
- **Available to use the same load cell Until Max. 16pcs (300Ω standard)**
- Easy to set up, change, check several values by the numeral key.
- Improved a convenience and precision of operating by Message Function.
- Can display a various information by F1, F2, F3 key for the end-user.
- Can make several key function use or disuse.(SETUP F10 Reference)
- Back up of Weight even electric spark case (SETUP F02 Reference)
- The permit or prohibition function of Calibration (ADJUST NO 10 Switch)
- Watch-Dog Guards for self-diagnostics.
- Available to change the function of the external input terminal (SETUP F16 Reference)
- Various option Functions for the end-user `s satisfaction such as RS-422/485, Current Loop, Analog out, BCD Input/Output and so on.
- RS-232C Serial Interface & Printer was installed basically
- Available to print by either Serial Interface or Centronics Parallel Interface

1-4. FRONT PANEL DESCRIPTION



1-4-1. DISPLAY LAMP

- ◎ STEADY : This Lamp will be ON when the weight is stable
 The steady Lamp Condition can be adjusted by SET UP F04, F08.
 It will be the standard of weight decision when running AUTO Function.
- ◎ ZERO : This Lamp will be ON with RED Color when the weight is empty.
 ZERO Lamp can be adjusted by SET UP F13, F03,
 It will be the standard of weight decision when running AUTO Function.
- ◎ TARE : This Lamp will be ON with GREEN Color when TARE Weight preset.
 (SET-UP F12 Reference)
- ◎ GROSS : This Lamp will be ON with GREEN Color when a current weight is Gross Weight.
 It will be possible to show TARE when setting up TARE.
- ◎ NET : This Lamp will be ON with GREEN Color when a current weight is Net Weight.
 It will be possible to show TARE when setting up TARE.
- ◎ EXT. : This Lamp will be ON with GREEN Color when the External Input Signal is ON

- ◎ PRINT : This Lamp will be ON with GREEN Color when it is Printing

- ◎ COM. : This Lamp will be ON with GREEN Color when it is communicating with
External Equipment.

- ◎ HOLD : This Lamp will be ON with Green Color when it is HOLDING(SETUP F25 Reference)

- ◎ AUTO : This Lamp will be ON when weight it is working AUTO

- t, kg, g** : This Lamp will be ON according to (SET-UP F01 Reference)

1-4-2. HOW TO USE KEY

*** The Key operating can be permitted or prohibited by SETUP-F10**

*** When pushing the key, it sounds "OK".**

*** Several Key works either a single function or compound functions.**

A compound function key is the command key when it push first and

In case of setting value according to the command key, then the numeral Key works.

Finally The key to finish a input data is **SET Key**.

* The time to input a data by compound key is limited to 5sec and automatically

Will be removed without the next key inputting.

☞ **ZERO Key** : This key can make the display weight zero for around weight.

The range of 2%, 10%, 50%, 90% of Max. Weight can be selected

By SET-UP F07

☞ **TARE Key** : The way to set-up the tare weight is two way as follows.

◆ Manual Way

1. Set-up of TARE Key

① Put TARE on the weighing plate

② TARE Key → SET Key OR TARE Key → Numeral Key → SET Key

2. Remove of TARE Key

① Remove TARE on the weighing plate

② Push TARE Key and push SET Key.

◆ Automatic Way

1. Auto-TARE setting if TARE was on the weighing plate

2. Auto-TARE setting after putting TARE and Auto-TARE Remove

After Taking away TARE on the weighing plate.

※ Please refer to SETUP F12

☞ **Gross/Net Key** : After setting TARE, It can convert from Net Weight to Gross weight,

Or from Gross weight to Net Weight

● Available to convert setting TARE only.

● Gross Weight will be ON when it was on the mode of Gross Weight

☞ **PART Key** : Usable to confirm or change the product part

* Can set up the data of each product from 1 No to 40 No.

- Checking PART : **PART** Key → **CLR** Key
- Changing PART : **PART** Key → Numeral Key → SET key

☞ **F1,F2,F3 Key** : This keys appear a various data as the end-user demands.

Available to use the end-user demanding by SETUP F21,F22,F23

(SET UP F21 REFERENCE)

☞ **COUNT Key** : This Key shows the finished working number of a preset PART.

- Unavailable to change the PART on purpose.

☞ **TOTAL Key** : This Key is to delete or print Sub-Total and Total Weight.

- **Delete** : CLR + TOTAL + SET >>> Sub- Total Delete.
 CLR + TOTAL + TOTAL + SET >>> Total weight Delete.
 ※ Sub-Total will be deleted when deleting TOTAL weight automatically.
- **PRINT** : TOTAL + PRINT >>> Sub- Total Printing
 TOTAL + TOTAL + PRINT >>> Total weight Printing.
 ※ It can be deleted when Printing according to F18(Reference).

☞ **CODE Key** : Each PART can be confirmed or set up Until Max. 6digits

- **CODE Confirm** :

Please press CODE Key then it will show CODE Number and If pressing CLR Key then it will be removed

- **CODE Set up** :

Please press CODE Key and input your target CODE Number and press SET Key

☞ **HOLD Key** : This key is to set/delete HOLD Functions and available to select a various Function
By SET UP F25

- F25-00 Manual HOLD : Holding the current weight in the display.
- F25-01 Manual HOLD(Average) : Holing the average weight in the display
- F25-02 Holding In Steady : Holing the current weight in Steady Based on more than Empty.
- F25-03 Holding Peak Weight(1Time) : Holing the Max. weight Based on more than Empty.
- F25-04 Holding Peak Weight(Continuous) : Holing the Max. weight Based on more than Empty.
- F25-05 Hold Prohibited : Not Available to use HOD Function
- F25-06 Holding Peak Weight(Continuous) : Holing the Max. weight in Steady Based on more than Empty.

☞ **AUTO Key** : This key is to set/delete HOLD Functions and available to select a various Function
By SET UP F24

- F24-00 : Auto-Recording the current weight in Holding the weight in the display.
- F24-01 : Available For Auto Hold Function(Not Available For F25-00,01)
- F24-02 : Available For Auto Hold Function and it will be removed in EMPTY
- F24-03 : Auto-Recording the current weight in Steady
- F25-04 : Auto-Recording the current weight in EMPTY After recording the current weight in Steady

☞ **PRINT Key** : This Key is to Transmit, Total Weight, Print DATA in manual.

- Unavailable to run it while Auto Mode
- **CLR + Print when deleting the last TOTAL Weight.**
- Unavailable to Re-power In , change the PART
- It will be available 1time only
- The last total weight will be deleted in case of Auto-total weight

☞ **CLR** Key : It show the clear mode as "—" on the below display.

CLR Key is used for the below application.

- 1) It is used for canceling the preset .
- 2) **CLR + TOTAL(+TOTAL) +SET** When Deleting Total Data.
- 3) **CLR + Print when deleting the last TOTAL DATA.**
- 4) For Converting SET UP Function or Calibration.(3 Chapter, 4Chapter Reference)

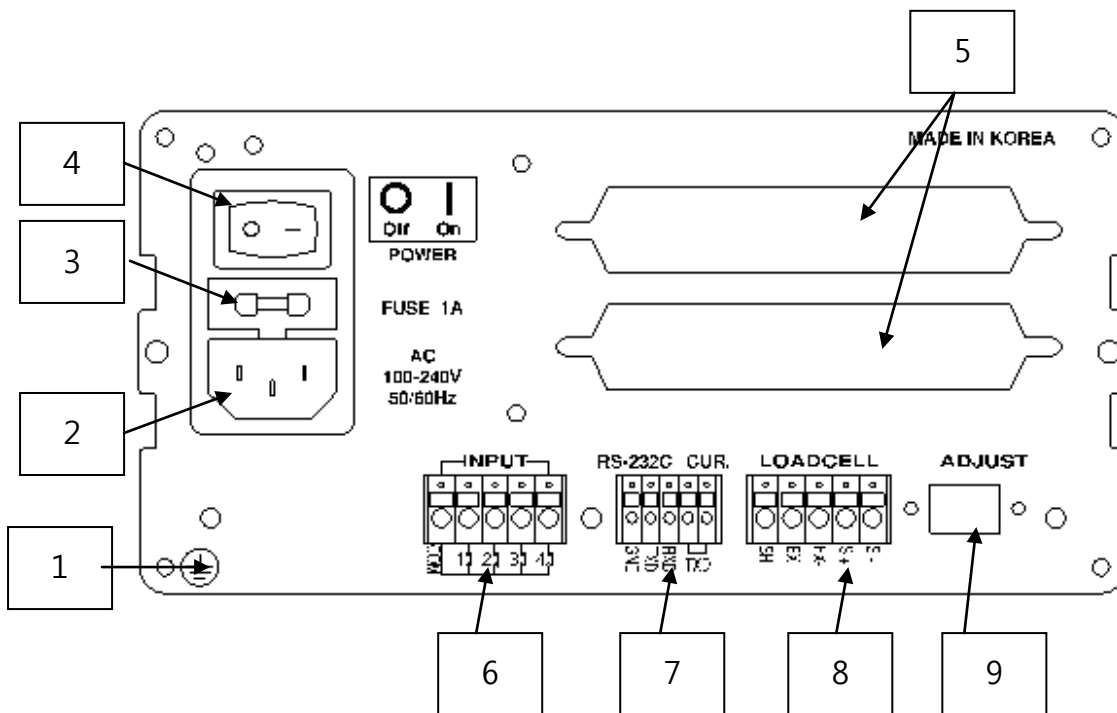
After CLR Key, If No Inputting the added Data, it will be deleted automatically

☞ **SET** Key : **SET** key is used for the below 2 kinds of application.

- 1) It is used for memory all preset value.
- 2) It is used for SET UP and Calibration. (3 Chapter, 4 Chapter Reference)

It should press SET key after inputting the preset.

1-5. REAR-SIDE PANEL



1. **F.G.** : Please earth it for safe.
2. **AC IN** : Available to change AC110 ~220V by Free Voltage
3. **FUSE** : please use the standard approved when it replace.
(FUSE) AC250V, 0.3A (a glass tube with small type)
4. **POWER S/W) ON/OFF** : It will be safe to use it after 10minuate warming time.
5. **DATA OUT** (Option Board.) :
Serial Communication. RS422, BCD In/Out, Analog Out 0~10V, 4~20 mA
Print Out(Serial Print / Centronics Parallel)

6. IN-PUT :

It will be used for controlling this indicator from the external equipment.

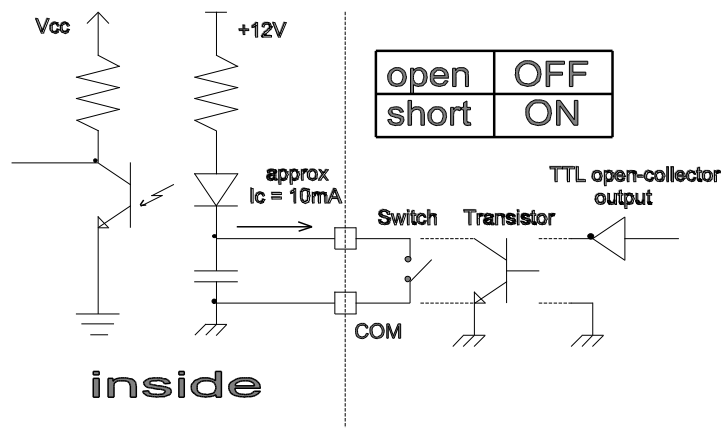
The functions of input terminal is to choose it by SETUP F16

Because the power supply of input terminal is done by 12DC inside,

Do not power in from the external

Also use this output For control signal Only but do not use it for running it directly.

- An electric current is about 10mA.
- Make Min. input time by more than 50mSEC.



7. RS-232C

- TXD, RXD(Standard)
- It will be available to use the baud rate until 38.4Kbps

9. Load cell Connector(N-16)

- ① EX+ (+5V) ② EX- (-5V) ③ SIG+
- ④ SIG- ⑤ SHIELD

10. ADJUST : It has DIP Switch which can adjust ZERO and SPAN

- NO 1 : Prohibited Calibration (On = Calibration Lock)
- NO 2 : Checking it out if the loadcell or equipment will be normal(On=Loadcell Input 0V)
- NO 3 : Zero Adjustment(ON = Zero Down)
 - ON : + Weighing Only
 - OFF : + or - Weighing.
- NO 4~5 : Amplifier Adjustment(ON : Amplifier Reduction)
- Factory Setting Dip-Switch.

OFF					
ON					
	1	2	3	4	5

NO 4	NO 5	Amplified Size	
ON	ON	SMALL	1 Times
OFF	ON	GENERAL	2 Times
ON	OFF	BIG	3 Times
OFF	OFF	BIGGER	4 Times

● 1-6. SPECIFICATION

1. Analog Input & A/D Conversion

Input Sensitivity	0.2 μ V/D
Max. Load cell Input	1mV/V ~ 5 mV/V
Load cell excitation	DC 5V (\pm 5 V)
Max Input voltage	32mV
Temperature Coefficient	\pm 5 ppm / $^{\circ}$ C
INPUT Noise	\pm 0.5 μ V P.P
INPUT Impedance	More than 10 M Ω
A/D Converter	520,000 Count
Non-Linearity	0.003% F.S
A/D Conversion Speed	25,30,50,60,100,120,150,180,200,240Times/Second

2. DIGITAL SECTION

MAX.DISPLAY	"999999"
MIN.DIVISION	x1, x2, x5, x10, x20, x50
DISPLAY UNIT	7-Segment, 6digit Highly bright fluorescent(LED Type)
KEY BOARD	Numerical Key and Function Key(0-9,CLR,SET/CLR)
Data Back-up	More than 20Years

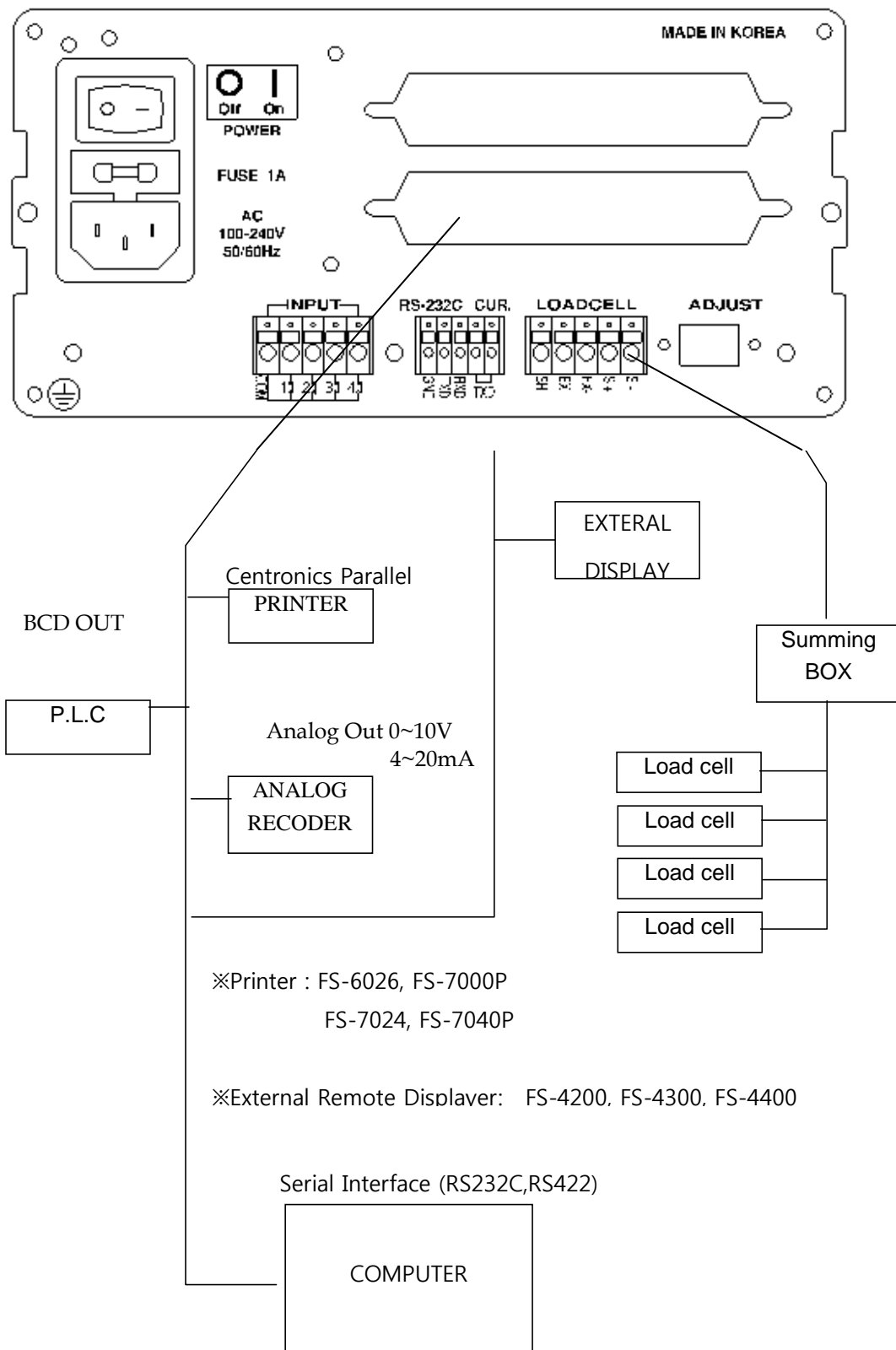
3. GENERAL

POWER	AC110 / 220V (\pm 10%), Free Voltage 50 / 60Hz, 10VA
PRODUCT WEIGHT	NET 1.2kg BOX 2.0kg
Operating Temperature	-10 $^{\circ}$ C ~ 40 $^{\circ}$ C
Operating Humidity	85%RH MAX (Non-Condensing)
External Dimension	198 x 99 x 101mm, Install Size 186 x 92mm

4. OPTION

OP-03	Parallel I/F : BCD Out Weight
OP-04	Serial I/F : RS422, RS485
OP-05	Analog Voltage Out (0-5V / 0-10V)
OP-06	Analog Current Out (4-20mA)
OP-07	Print I/F : CENTRONICS Parallel
OP-10	Parallel I/F : BCD In PART
OP-11	Serial I/F : CH-A, CH-B Extension CH-A = RS-232C, Current Loop CH-B = RS-232C, RS422, RS485

1-7. How to connect to External Equipment



CHAPTER 2. INSTALLATION

☞ Installation Caution.

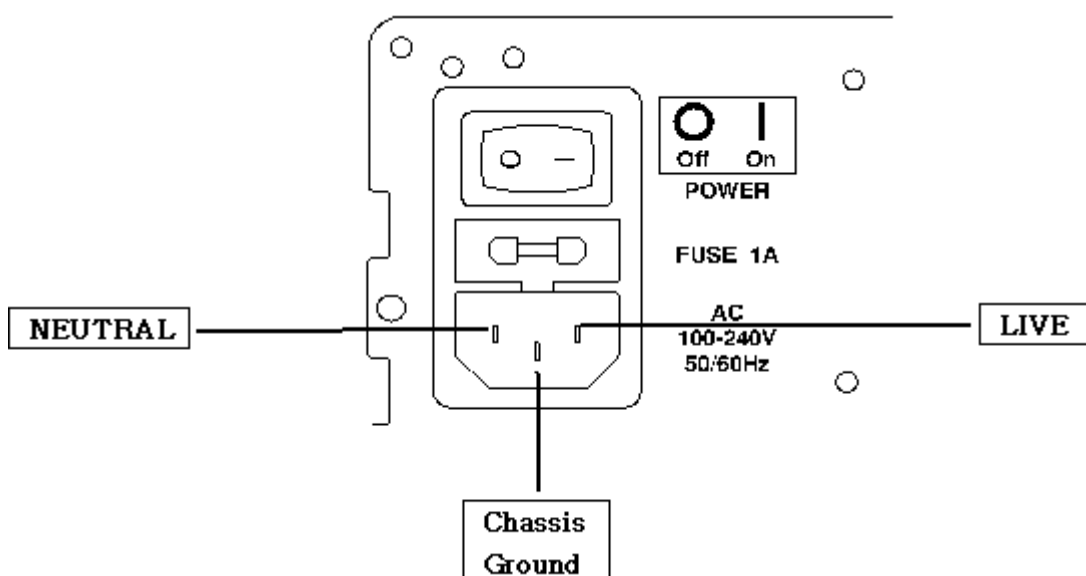


- Be careful for avoid from a strong impact, vibration. temperature. water, wind.
- Be careful for avoid Installation from a high moisture around.
- Be careful for avoid Installation from a high temperature fluctuation.($\pm 10^{\circ}\text{C}/\text{h}$).
- Be careful that the power should be isolated from the main power box.
- Be careful that the power should be done by the standard voltage
- (110V/220V \pm 10% 50/60Hz – First Power voltage **220VAC**)
- Be careful that the main switch should be off for connecting to the external device.
- Be careful that it should ground with the external device.
- Note that it should calibrate and set up for the first installation.

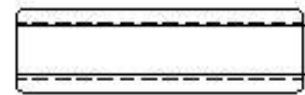
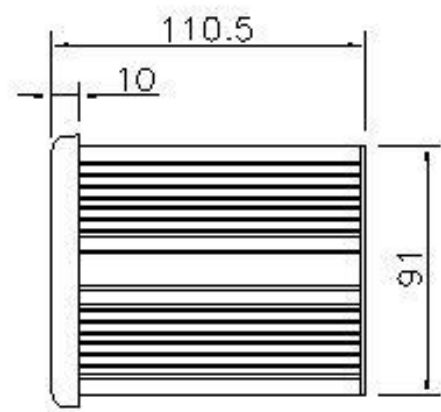
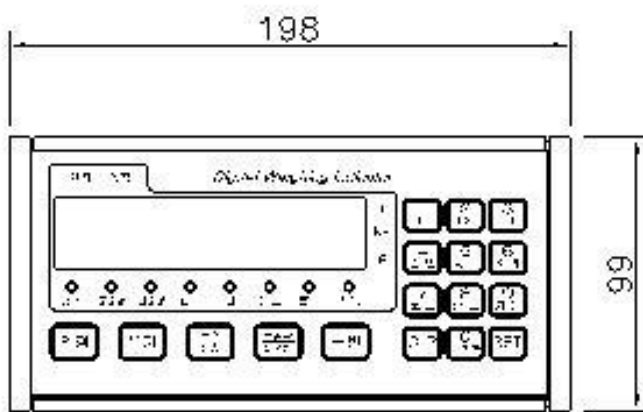
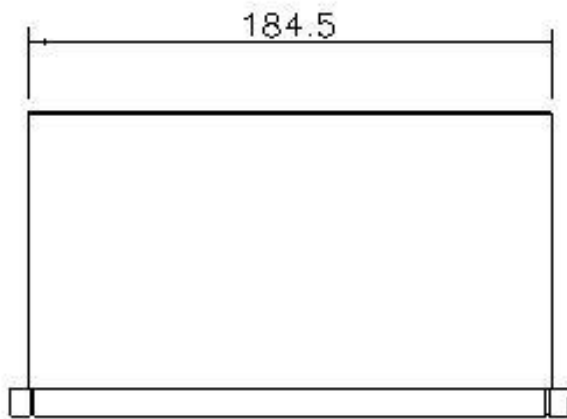
☞ Necessary Part for installation.



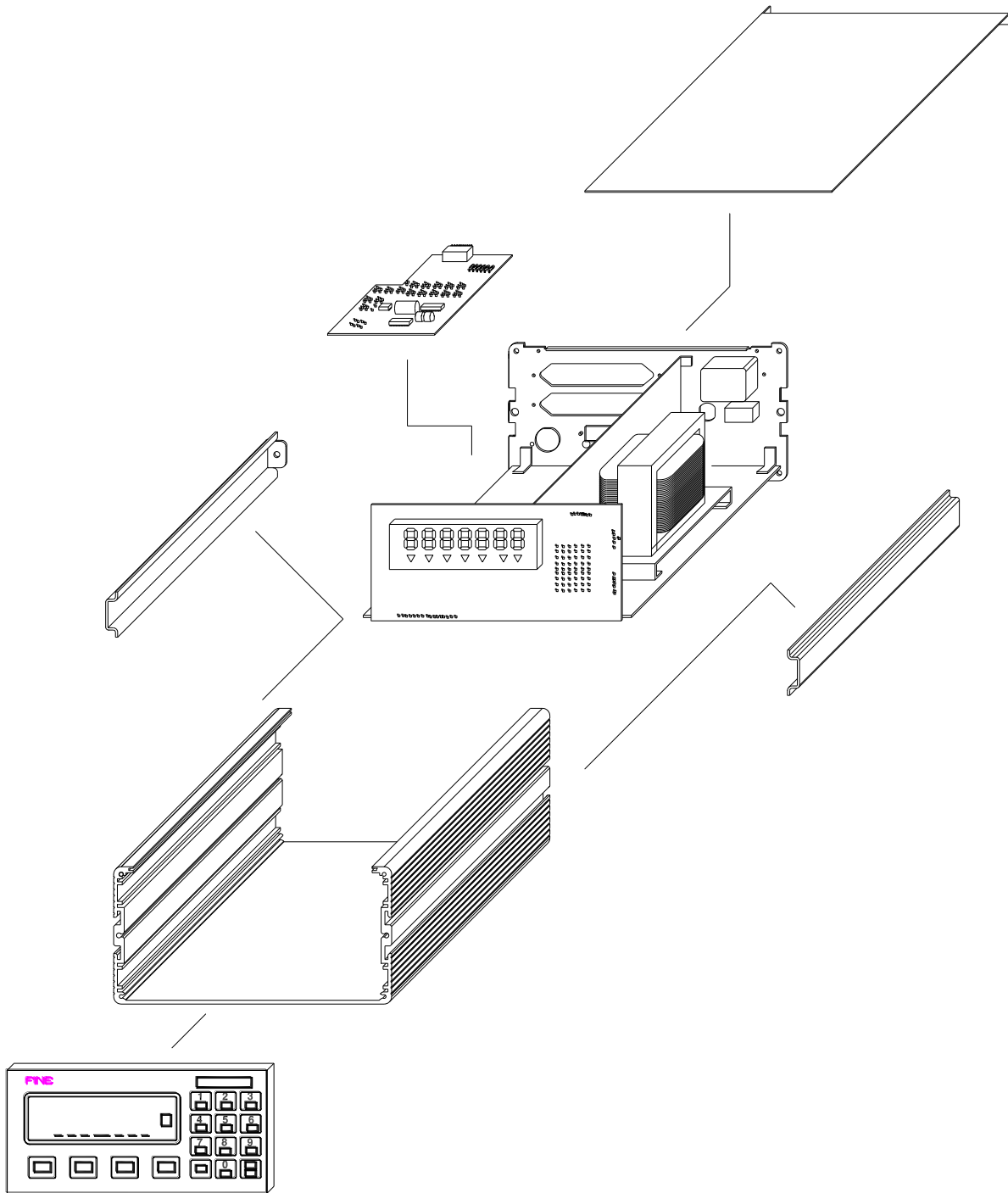
- Power Code Connector : 1EA
- FUSE : 2EA (PIPE TYPE 250V 0.3A SMALL TYPE)
- LOAD CELL Connector : 1EA (N16-05)
- Instruction Manual : 1Copy
- Adaptable Connector for Option Connection.



2-1. Out-Dimension & CUTTING SIZE



2-2. ASSEMBLE DRAWING



2-3. HOW TO CONNECT TO LOADCELL

1. Recommend Load cell

The Rated Output(R.O) of a load cell should be 1mV/V ~ 5mV/V

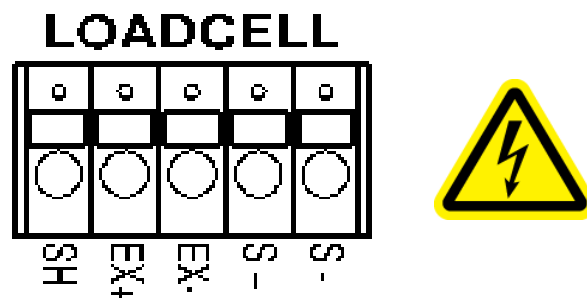
Specially FINE Cell is 2 mV/V \pm 0.005 and can be supplied together.

▣ **The Rated Output voltage of load cell is not absolute value but relative value.**

Ex) The Rated output voltage is the same with 3mV/V for 10kg Load cell and 10ton.

2. Load cell Connector

- Please connect the indicator to a load cell according to the wire color.
- Available to connect the load cell Until Max. 16pcs Load cell in parallel.(Max 300 Ω)



3. The wire color depending on the load cell manufacturer

Manufacturer.	1 EXC +	2 EXC -	3 SIG +	4 SIG -	5 SHLD	Reference.
FINE CELL	Red	White	Green	Blue	Shield	
CAS	Red	White	Green	Blue	Shield	
Interface	Red	Black	Green	White	Shield	
Tedea	Green	Black	Red	White	Shield	

※ Load cell Connector Standard : N16-05.

※ Please check the load cell specification sheet out again

Because the load cell wire color depends on the manufacturer


2-4. ERROR & CLEAR

Error	Cause	Clear	Reference
Unstable Weight	① Load cell Broken. ② Load cell Insulation Resistance Error ③ Touching to a moving frame. ④ Touching to a moving frame	① Measure the rated output of load cell. ② Measure load cell Insulation resistance	① Input resistance : about 420 Ω ② output resistance about 350 Ω ③ Insulation resistance : 100 M Ω
Not regular Increasing Weight Or Not return to ZERO	① Load cell broken. ② Load cell not connecting	① Measure load cell insulation resistance (normal : 100 M Ω or OL display) ② check load cell connector	
Minus Weight(-)	① Rated output of load cell (SIG +, SIG -) exchanged	① check load cell connector.	ERR-55.
"bAd"	① Load cell Broken. ② Connect Condition. ③ Out of basic ZERO	① check load cell. ② check load cell connector.	
"UL" (Under Load)	① Load cell Broken. ② Connect Condition. ③ Out of basic ZERO	① check load cell. ② check load cell connector.	
"OL" (Over Load)	① Load cell Broken. ② Connect Condition. ③ Excessive Weight.	① check load cell. ② check load cell connector. ③ remove excessive weight	

CHAPTER 3.CALIBRATION

What is Calibration?

Calibration is to make Max. Weight, Min. Division, Decimal point which Digital Indicator displays be consistent to the actual weight loaded by a load cell on the platform.

 **It should calibrate certainly when a load cell or indicator will be changed.**

3-1. ZERO ADJUSTMENT

Basically it does not need to Adjust ZERO Value

Please use it according to your application as follows

- **Normal Zero Adjustment : Dip-Switch No 3(ON)**
- **Zero Adjustment need + Valve or -Valve of weight : Dip-Switch No 3(OFF)**

3-2. SPAN ADJUSTMENT

what is span adjustment.

Span adjustment is to adjust the Linearity which makes the display value from "0" to Max. Weight Consistent to the actual weight

- Please do **OFF** NO 1 of Dip-switch For Calibration Access.

▶ How to access the SPAN ADJUSTMENT.

There are 2ways to access the span adjustment

The first way

If you power in Digital Indicator while pressing No 3 Key of keypad

Then it displays " test "

Then if pressing No 3 Key again then it displays "**St. CAL**"

And if pressing " St. CAL" key it displays " d xx(01,02,05,10,20,50) ".

For example,

- Power In while pressing No 3key of Keypad >>> "**test**"
- Press No 3key of keypad again. >>> "**St. CAL**"
- Press SET/CAL >>> "**d 02**"

☞ The second way

① If Pressing **SET** key for 3second, It will display "**St. CAL**"

Press SET again

② "**St. CAL**" means SETUP & CALIBRATION mode

▶ HOW TO ADJUST SPAN.

S&C MODE have 7way to adjust span. Each step will be advanced with **SET** key.

Also, **CLR** key was used to return to the previous display.

- For the next Step : Press **SET** key
- For the previous Step : Press **CLR** key

☞ 1STEP.

A step to set up a division (Digit) and decimal point.

"d" means "Division" and "xx" means a division capable of displaying.

Also this "xx" will be displayed as 01-02-05-10-20-50 whenever pressing 0(zero) Key

In case decimal point is "0.0" then press 2 Key.

In case decimal point is "0.00" then press 3 Key

In case decimal point is "0.000" then press 4 Key.

In case decimal Point is not then press 1 Key.

And press **SET key**, then it will be go to the next step recording a division and the position

Of decimal point.

☞ 2Step

A step to set up Max. Weight.

The display will appear "**CAPA**"(Capacity) and discretion number(Max.6Digit)

It can input the Max. Weight as the end-user demands instead of discretion number.

How to input is to press **SET** key after inputting discretion number.

♣ Do not excess (A division ÷ Max. Weight) with over **1/30,000**

If exceeding over **1/30,000**, it will display "**Err 01**".

☞ 3Step

A step to check the zero conditions of Indicator.

After appearing "**dEAd**", the discretion number(Max.6digits) will appear.

If the present number is 0 or 500,000 then please check the loadcell Connection out again.

Please press **SET key**.

☞ 4Step

A step to set up test weighter for SPAN Adjustment.

Indicator will display the capacity at weight column which was set at 2 step

After being displayed "SPAN".

Please input the value of Test Weighter for span adjustment by numeric key.

This value of span Test Weighter must be equal to full capacity, or over 10% of full capacity.

- In case of less 1/5,000 resolution , the value of Test Weighter must be over 20% of full capacity)
- If span capacity is set less 5% or over Max. Weight , Indicator will display error message.
As "Err 02 or 03"

☞ 5Step**A step to load test weighter on the platform .**

If it input 1000kg on the above 4STEP. Then it displays "Load".

Put the actual test weighter or the test weighter, 10% of full capacity. And SET Key.

- (Notice)

If indicator is unmatched with load cell capacity or span standard weight,

The Indicator will display Error message "Err04"

☞ 6Step**A step to display Span Constant Value counted.**

If the range of this constant value is between 0.5000 -- 3.50000, All procedure of span adjustment Is normal.

- (Notice)

This span constant value can not be adjusted by the numeral key or other way.

☞ 7Step**A END Step.**

If it display "END" then Span Adjustment was finished completely.

Then unload the Standard Weighter from the platform and press SET Key.

■ For Example of SPAN ADJUSTMENT

- Max. Display Division = 50.00kg
- Display Setting Interval = 10g
- Test Weighter = 10.00kg

STEP	S&C Select Mode	St. CAL
1 STEP	Press SETL	d 50
	Adjust a division by pressing 0 key	d 01
	Setting Decimal point by 3key	d 0.01
2 STEP	Press SET	c 80.00 after displaying CAPA
	Press 5000 by numeral Key	c 50.00
3 STEP	Press SET	d 9660 after displaying dead
	* Adjust ZERO POINT if this Weight Value was 0 ~ 500,000	
4 STEP	Press SET	s 50.00 after displaying SPAn
	Press 1000 by numeral Key	
5 STEP	Press SET	Load
	Load The Standard Weighter on the platform	
6 STEP	Press SET after 3second	0.97482
7 STEP	Press SET	End
	Press SET after unloading Test Weighter.	TEST " 7segment " in display. After "FinE"
	In the display	0.0 then it will be normal

3-3. ERROR MESSAGES & ADJUST

※ **tEst** or **FS-XXXX** : If indicator display only " tEst " or FS-XXXX (Model number)
without any operation ,first of all you must adjust "Dip-Switch"
of back side panel for span and zero value.

※ **ERR--01**

- ①Cause : In case resolution (A Digit/Max. CAPACITY) was set over 1/30,000 resolution.
- ②Adjust : Adjust the digit or Max. Max. CAPACITY again to be less than 1/30,000 resolution

※ **ERR--02**

- ①Cause : In case Standard Test weight was more than Max CAPACITY
- ②Adjust : Make Set Standard Test weight equal or less than Max CAPACITY

※ **ERR--03**

- ①Cause : In case Standard Test weight for span adjust was set less than 5% of Max CAPACITY
- ②Adjust : Adjust Standard Test weight for span adjust with more than 5% of Max CAPACITY

- In case of 1/5,000 Resolution.

Please Adjust Standard Test weight for span adjust with more than 20% of Max CAPACITY
Then it can do more correct SPAN Adjustment.

※ **ERR--04**

- ①Cause : In case the weight was not Steady when it account the value of a span constant
- ②Adjust : Adjust a span again after removing a cause to be unstable or to have vibration.

※ **ERR--05**

①Cause : In case the actual weight was more than Standard Test weight in SPAN Adjustment
Or the amplification Volume of Analog circuit inside was very bigger.

②Adjust :

- Please check it if the actual weight was more than Standard Test weight setting out or not
If it did so, please adjust the standard Test weight as much as the existed set up weight
- If it continue to display ERR--05, Adjust NO 4,5 of Dip-Switch on the rear panel.
- The way to use the Dip-Switch NO4, NO 5

NO4	NO5	Amplified Volume	
ON	ON	Small	1times
OFF	ON	Normal	2times
ON	OFF	Big	3times
OFF	OFF	Bigger	4times

OFF
ON

- Please adjust SPAN again after adjusting less than the present adjusted value.

※ If it continues to display ERR--05 in spite of adjusting the Dip-Switch as the above,
Please check it if the cable wire of a Load cell was correct or not according to the cable color

※ **ERR--55**

①Cause : In case a cable wire of a Load cell was connected on reverse.

②Adjust : Please check the connection of a Load cell as a reference of **2.3 CHAPTER**

※ **ERR--06**

①Cause : In case the actual weight was loaded less than standard balance weight
Or was less than Analog Circuit Amplification.

②Adjust :

- Please adjust a standard balance weight into the weight set up.
- If continue to display ERR--06, Adjust NO 4,5 of the Dip-Switch on the rear panel.
- The way to use the Dip-Switch NO4, NO 5.

NO4	NO5	Amplified Volume	
ON	ON	Small	1times
OFF	ON	Normal	2times
ON	OFF	Big	3times
OFF	OFF	Bigger	4times

OFF
ON

- Please adjust SPAN again after adjusting less than the present adjusted value.

※ If it continue to display ERR--05 in spite of adjusting the Dip-Switch as the above,
Please check it if the cable wire of a Load cell was normal or nor.

※ **ERR--07**

- ①Cause : In case it was deviated from a range of value which can be set by SET UP,
- ②Adjust : Please input the contents of SET UP again.

※ **ERR--10**

- ①Cause : In case the record device of Memory or Hardware was not normal
- ②Adjust : It can be worked by a voluntary key, but it was temporary way.
So, please try to send this Indicator to the head office for A/S.

※ " **UL**" (**UNDER LOAD**)

- ①Cause : In case the connection of a Load cell was not normal or a Load cell was broken.
- ②Adjust : Refer to the part related with a Load cell or **CHAPTER 3** ZERO ADJUSTMENT.

※ " **OL**" (**OVER LOAD**)

- ①Cause : In case the connection of a Load cell was not normal or a Load cell was broken.
- ②Adjust : Refer to the part related with a Load cell or Remove a excess weight.

CHAPTER 4. SET-UP

4-1. PREFACE

" SET-UP " is to choose each proper functions for matching the indicator with the appliances of field.

▣ How to enter into set-up mode

This set-up mode is required for proper weighing operation when Indicator connects With other appliance. It can enter into sep-up mode by the below two steps.

☞ The first Step

Depress key "**Ⓞkey**" first and power on at the same time.

At that time, "**tEst**" word will be displayed on indicator.

Depress key "**Ⓞkey**" again, and indicator will display as following :

S t, C A L. ; S & C Mode

At this time, press CLR key.

Indicator will display to " F01-xx " from above test message.

* For example

The power was OFF

1. Power "ON" while pushing **Ⓞkey** ----- "**tEst**"
2. Pushing **Ⓞkey** again ----- "**St. CAL**"
3. Push **CLR key** ----- "**F01 - xx**"

☞ The second Step

If you depress key " SET/CAL " for 3 seconds at the normal weighing mode,

Indicator will also display "**St. CAL**" as the above.

4-2. SET-UP

- ① If it press **CLR** key at S&C Mode, Indicator will display "**F01-xx**"

The F of "**F01-xx**" means Function and 01 means Function number

And the last 2figure "**-xx**" means each functional setting number

* For example

Pushing CLR key in "**St. CAL**" mode then displays as " F01-01 "

Function number will be increased to the next Function whenever it presses .

- ② If you proceed to next function, press CLR key or,

If you want to see your desirous any function number,

Press "CLR" key after input any function number by numeric key.

Indicator will display function number directly from present function number.

(EXAMPLE)

* Present display : F01-01

Press CLR key ----> "F02-00" display ----> Press CLR key.

----> "F03-01 display ----> Continuously press CLR key ---->

"F04-XX" ----> "F05-XX" ----> "F06-XX" ---->

Press CLR key in streams, the next function number will be displayed.

* Present display : F01-01

If you want to see function number 12,

Press numeral key "1" and "2" ----> Press CLR key ----> "F12-XX" display

- ③ If you want to change each functional setting number newly,

Press SET key after input the functional setting number by numeral key.

(EXAMPLE)

If "F01-01" is changed to "F01-03",

Press 3 key ----> F01-03 display ----> Press SET key.

A new function number will be memorized.

(Remarks) When you want to change " S & C MODE " from Set-up mode,

Please press key " 0 " + " CLR " consecutively.

※ **ERR--07**

①Cause : In case it was deviated from a range of value which can be set by SET UP,

②Adjust : Please input the contents of SET UP again.

4-3. F-FUNCTION SUMMARY LIST.

	Function	Contents
00 Group – Set the basic weighing		
F 00	S & C MODE Conversion	Selection for SET UP and Calibration.
F 01	Select Unit of weight	Kg, ton, lb, g, N, kN
F 02	Weight BACK-UP	Normal, Back-up, Auto Back-Up
F 03	Set ZERO tracking Range	0, 0.2, 0.5, 1, 2 digit
F 04	Set Motion Band	0.5, 1, 2, 4, 8 digit
F 05	Set Auto Zero Range	0~99(auto zero range)
F 06	Digital Filter	0~9(reduction of waving)
F 07	Set ZERO Range	2,10.50,90% of Max. Weight
F 08	Delay time For measure	0~99(1 count = 0.1sec)
F 09	Set ZERO Range	1000~60000 range , No Limit
10 Group – Set the basic parameter setting		
F 10	Set Keypad Lock	Prohibition, Permission of Key access
F 11	Key Run for ZERO and TARE	Steady, Unsteady
F 12	INPUT TARE	Set numeral key tare, actual tare, auto tare
F 13	Empty Signal	Select output signal of zero, empty
F 14	Empty Range	Set Empty Range
F 15	Set Empty Standard	Display weight, basic zero, tare zero
F 16	External Equipment Input Mode	Input Terminal Definition
F 18	TOTAL Delete	Delete TOTAL in manual / auto
F 19	Select Auto and Manual	Select Manual, Auto in case of power in
20 Group – Control Way		
F 21	F1 Key Function	No define or set
F 22	F2 Key Function	No define or set
F 23	F3 Key Function	No define or set
F 24	Set AUTO Function	Select Steady, Discharge, Hold
F 25	HOLD Function	Hold, Max. Hold, Mean Hold
F 26	CODE Number Nominated	No change of 1times, Increase, Decrease
30 Group – Serial Interface Specification		
F 30	Baud Rate	600,1200.....9600.....38400 kbps
F 31	Parity Bit	EVEN, ODD, NO Parity
F 32	Transmit Mode	Continuous, Steady, TOTAL, Command
F 33	Transmit Data Format	Weight, Weight + time, Transmit Mode
F 34	STX Attach For transmit Data	No, Insert
F 35	Interface wire control For RS, CS	Available(RS422,RS485), Unavailable
F 36	Select Interface Weight	Always transmit Net/Gross Weight
F 37	Set Transmit Comma(,)	Select “,” or not.
F 39	Set the delay time for transmitting DATA	0~99(1 Count = 0.01SEC)

	Function	Contents
50 Group – Set the basic weighing		
F 50	Select output of target	Display weight, Gross, Net
F 51	BCD OUT Parity	Positive / Negative Output
60 Group – Set Analog Out		
F 60	Select output For Analog Out	Display weight, Gross, Net
F 61	Select Analog Out Standard	Max. weight, Standard weight
F 62	Select Analog Out Polarity	Positive / Negative Output
F 63	Set Standard weight for Analog Out	Set Standard of Max. Output
F 68	Adjust Zero Signal for Analog Out	
F 69	Adjust Span Signal for Analog Out	
70 Group – Set the basic weighing		
F 71	Printer Sheet Select	Continuous / Net
F 72	Set Line Feed For Printing	1count = 1 line(0~99)
F 73	Set Sub-print Printer Mode	Standard, Min / Max. mean weight print
F 78	CH-A Interface Weight Select	Display/W, Final/W, Total/W, Actual/W
F 79	CH-B Interface Weight Select	Display/W, Final/W, Total/W, Actual/W
80 Group – Serial Interface(Optional) CH-A, CH-B		
F 80	CH-A Baud Rate	300,600.,. 38400 bps
F 81	CH-A Parity Bit	EVEN, ODD, NO Parity
F 82	CH-A Transmit Mode	Continuous, Steady, TOTAL, Command
F 83	CH-A Transmit Data Format	Weight, Weight + time, Transmit Mode
F 84	CH-A STX Attach For transmit Data	No, Insert
F 85	CH-B Baud Rate	300,600.,. 38400 115.2k bps
F 86	CH-B Parity Bit	EVEN, ODD, NO Parity
F 87	CH-B Transmit Mode	Continuous, Steady, TOTAL, Command
F 88	CH-B Transmit Data Format	Weight, Weight + time, Transmit Mode
F 89	CH-B STX Attach For transmit Data	No, Insert
90 Group		
F 90	Equipment ID	00~99
F 91	L.E.D Color Convert	00~05
F 94	Set A/D Conversion Cycle Times	25 ~ 240
F 95	DATE Adjust	yy – mm – dd in case of print option
F 96	TIME Adjust	hh – mm - ss in case of print option
F 98	A/D Conversion for basic ZERO Value	Checking load cell trouble
F 99	Checking SPAN Constant	Checking load cell trouble

CHAPTER 5. SET-UP FUNCTION

5-1. BASIC FUNCTION FOR WEIGHING

F00 -	S&C MODE CONVERSION
-------	--------------------------------

Select Unit of Weight		
F01	⓪	Kg
	1	Ton
	2	Lb
	3	g
※Unit will be used for Interface and Printing.		

Weight BACK-UP		
F02	0	NORMAL
	1	BACK – UP
	②	AUTO BACK – UP
	※. In case of NORMAL It will not record the weight which was out of power and it must use digital indicator After removing the Product on the platform. ※. In case of BACK-UP . It will record the weight which was out of power. ※. In case of AUTO BACK-UP . When it was Power On, it will show "0" if the weight was inside the zero range by F07 And will convert automatically the above No 1 Function ※ Set BACK-UP MODE after adjusting the weight on NORMAL condition	

Set ZERO Tracking Range		
F03	0	Unavailable for ZERO Tracking
	①	0.2DIGIT / 0.5sec
	2	0.5DIGIT / 1sec
	3	1DIGIT / 1sec
	4	2DIGIT / 1.5sec
<p>※ What is ZERO Tracking ?</p> <p>If A weight continue to change with a small value, It displays the weight in spite of No product on the weighing part. It is to compensate such a value</p>		

Set Motion Band			
F04	0	0.5 Digit	<p>※ Motion Band ?</p> <p>It means compensating a weight changing for a moment. If the weight change was less than the present set value for the time set by F-08, then it will be steady weight and will be ON in the display.</p>
	①	1 Digit	
	2	2 Digit	
	3	4 Digit	
	4	8 Digit	
<p>It will be steady weight if weight changed volume was not out of motion band set. It will be used according to a lot of vibration and a little vibration environment.</p>			

Set Auto Zero Range		
F05	0~99	<p>If it displays the remained weight after discharging and displays steady then the remained weight will be "o".</p> <ul style="list-style-type: none"> ● First setting 00
<p>Example,</p> <p>If Gross Weight was set by 3kg/1g and F05 was 10 then ZERO will run automatically until 1~10g</p>		

Digital Filter			
F06	0~9	Small ~ Large	* (0,1,2) when it request high response like tester. *(3, 4, 5, 6) when it request a normal weighing. *(7,8,9) when it request a high vibration.
It will be used to reduce the wave of weight. If set value was small the response speed is faster but it is weak for vibration. Otherwise, if set value was large then the response is slow but it is strong for vibration.			

Set ZERO Range		
F07	0	In 2% of Max. Weight
	①	In 10% of Max. Weigh
	2	In 50% of Max. Weight
	3	In 90% of Max. Weight
ZERO Range can be set by ZERO Key and External ZERO Input. ※ Caution. If zero range was set by 50% and 50kg of 100kg load cell was ZERO then if the actual weight will be loaded until 100kg then the load cell may be damaged because the total weight to load cell was 150kg so, set the ZERO Range after checking the load cell capacity.		

Delay Time For measure.		
F08	0~99	A weight is a division range set by F-04 and after Set time , it will be a steady Lamp and measure in Auto mode. ● First Setting : 10 (1 sec) ● 0.1sec Delay/per 1count

Set ZERO Range.		
F09	⓪	Run when Based ZERO Value was inside the Range by F07
	1	Run without Based ZERO Value.
	※. Unavailable for F02-01(Weight Back Up Mode)	

5-2 . SET BASIC FUNCTION

Set Keypad Lock		
F10	⓪	All key available to access
	1	Not available for TOTAL, HOLD,PRINT,TARE, GROSS/NET Key
	2	Not available for all key except of ZERO,CLR,SET Key
※This function was designed to prevent from mistake - operating		

Key Run For ZERO and TARE.		
F11	0	ZERO and TARE Key run when the weight is steady.
	⓪	ZERO and TARE Key run Even if the weight is waving.

Input TARE		
F12	0	TARE Key >> Input Tare weight >> SET. Or Loading TARE on the weighing table >> SET.
	①	Key in TARE after loading TARE on the weighing table
	2	When TARE will be steady in the range of 2times of Empty, Auto TARE will set or Re-set. It will be suitable for Discharging Mode. <div style="text-align: center;"> </div>
	3	When TARE will be steady in the range of 2times of Empty, Auto TARE will set and will remove when it was lower than Empty. It will be suitable for a filling Mode <div style="text-align: center;"> </div>
※ TARE Key will be worked by the above No 1 Function In case of F12-02 or F12-03		

EMPTY Signal		
F13	0	EMPTY Signal run when the weight was ZERO.
	1	EMPTY Signal run when the weight was ZERO and - weight.
	②	EMPTY Signal run in the Absolute Weight of EMPTY Range (F-14 Refer)
	3	EMPTY Signal run in the range of + range and - range
※ ZERO Lamp run when EMPTY Signal run in the display.		

EMPTY Range.		
F14	EMPTY Range	Auto Tare Function(Tare, TOTAL, Hold) can be used conveniently By this function.. ● First Setting : 000010

SET EMPTY Standard.		
F15	<input checked="" type="radio"/>	Display weight standard.
	1	Basic ZERO standard.
	2	ZERO standard set by TARE

External Equipment Input Mode					
F16		Input 1	Input 2	Input 3	Input 4
	0	ZERO	TARE	NET	GROSS
	①	ZERO	TARE	PRINT	NET/GROSS
	2	ZERO	TARE	HOLD REMOVE	HOLD
	3	ZERO	PRINT	SUB-TOTAL	TOTAL
	4	ZERO	TARE	SUB-TOTAL	TOTAL
	5	ZERO	TARE	PRINT	SUB-TOTAL
	6	ZERO	HOLD/REMOVE	PRINT	SUB-TOTAL
	7	ZERO	TARE	TARE REMOVE	PRINT
	8	ZERO	TARE	HOLD REMOVE	PRINT

※ Input to connect between COM and Input Terminal(Input time should be over 0.05sec.)
 ※ Net/ Gross Weight will be converted according to pressing key.
 ※ Hold(Level) is being holding while input signal exists only
 ※ Hold SET/Remove is iteration according to input signal.

TOTAL Delete		
F18	⊙	It delete when CLR + Sub-Total and CLR + Total Input
	1	It delete automatically when Sub-Total, Gross Printing

Select Auto and Manual		
F19	⊙	It will be Manual Mode when Power ON
	1	It will be Auto Mode when Power ON

F1 Key Function		
F21	<input checked="" type="radio"/>	NO Available
	<input type="radio"/>	1 Display Date
	<input type="radio"/>	2 Display Time
	<input type="radio"/>	3 Display Date and SET
	<input type="radio"/>	4 Display Time and SET
	<input type="radio"/>	5 Display Batching Cycle Frequency of Sub-Total
	<input type="radio"/>	6 Display Batching Cycle Frequency of Gross-Total
	<input type="radio"/>	7 Display Sub-Total
	<input type="radio"/>	8 Display Gross-Total
	<input type="radio"/>	9 Display Working Start Date
	<input type="radio"/>	10 Display Working Finish Date
	<input type="radio"/>	11 Display Working Start Time
	<input type="radio"/>	12 Display Working Finish Time

F2 Key Function		
F22	<input checked="" type="radio"/>	NO Available
	<input type="radio"/>	The below function was the same with F1 Function.
	<input type="radio"/>	

F3 Key Function		
F23	<input checked="" type="radio"/>	NO Available
	<input type="radio"/>	The below function was the same with F1 Function.
	<input type="radio"/>	

Set AUTO Function		
F24	0	Auto-Recording the current weight in Holding the weight in the display.
	1	Available For Auto Hold Function(Not Available For F25-00,01)
	2	Available For Auto Hold Function and it will be removed in EMPTY
	③	Auto - Recording the current weight in Steady
	4	Auto - Recording the current weight in EMPTY After recording the current weight in Steady
<p>F24 – 00 : Auto Recording will be worked as soon as it will be hold in AUTO Lamp This function is to record all weighing data in the current weight.</p> <p>F24 – 01 : Auto Hold and Hold Lamp will be worked according to F25 Function Without a separate Hold Setting. This function will be used for a frequent case required Hold</p> <p>F24 – 02 : Auto Hold and Hold Lamp will be worked according to F25 Function Without a separate Hold Setting and Hold Function and Lamp will be removed in EMPTY This function will be used for a continuous Hold required.</p> <p>F24 – 03 : Auto Recording in STEADY This function will be used for recording the weight or Printing.</p> <p>F24 – 04 : Auto Recording in STEADY and EMPTY at the same time This function will be used for recording the weight without pressing Print Key</p>		

HOLD Function		
F25	0	Manual HOLD : Holding the current weight in the display.
	1	Manual HOLD(Average) : Holing the average weight in the display
	2	Holding In Steady : Holing the current weight in Steady Based on more than Empty.
	3	Holding Peak Weight(1Time) : Holing the Max. weight Based on more than Empty
	4	Holding Peak Weight(Continuous) : Holing the Max. weight Based on more than Empty
	⑤	Hold Prohibited : Not Available to use HOD Function
	6	Holding Peak Weight(Continuous) : Holing the Max. weight in Steady Based on more than Empty.

CODE Number Nominated		
F26	⊙	Fixed
	1	Increasing it as much as "1" after 1 times Batching work
	2	Decreasing it as much as "1" after 1 times Batching work(Not available for "0")

5-3. SERIAL INTERFACE (RS-232C,CURRENT LOOP,RS-422/485)

Baud Rate				
F30	0	300 bps	⑤	9600 bps
	1	600 bps	6	14.4k bps
	2	1200 bps	7	19.2k bps
	3	2400 bps	8	28.8k bps
	4	4800 bps	9	38.4k bps

Parity Bit		
F31	⑥	7 Data + EVEN Parity
	1	7 Data + ODD Parity
	2	8 Data + NO Parity
	3	8 Data + EVEN Parity
	4	8 Data + ODD Parity

Transmit Mode		
F32	⑦	Stream Mode : a Continuous Data output
	1	A continuous data output when the weight is steady
	2	A continuous data output when the weight which is more than Empty was steady
	3	Data 1time output when measure finish
	4	COMMAND Mode Transmit and Receive.
	5	Serial Printer Mode ONLY(Option)
<p>※ F32-3 Measure Finish ?</p> <p>a) Manual Mode : Date output when pressing the print key.</p> <p>b) Auto Mode : Data output when the function of F24 run.</p> <p>※ The conversion of Manual / Auto can changed by "Auto" of keypad(F19 Refer)</p>		

Transmit Data Format		
F33	⑧	ST(Header1) , NT(Header2), Weight(8), kg(Unit) CR LF
	1	ST(Header1) , NT(Header2), Weight(8), kg(Unit), Time(6), CR LF
	2	ST(Header1) , NT(Header2), Weight(8), kg(Unit), Time(6), CR LF(CAS CI-5010A)
	3	ST(Header1) , NT(Header2), Weight(8), TARE(8) kg(Unit), Time(6), CR LF
	4	PART, ST(Header1) , NT(Header2), Weight(8), kg(Unit), Time(6), CR LF
	5	Toledo(8520) Format

STX Attach For Transmit Data		
F34	①	NO attach
	1	First character will be transmit by 'STX'(ASCII = 02)

Interface wire control for RS422(485)		
F35	①	NO Available for CS, RS In case of RS 422, 485
	1	Available for CS, RS.

Select Interface Weight		
F36	①	Transmit the weight was the same with the display weight.
	1	Transmit the final batched weight.
	2	Always transmit Gross Weight
	3	Always transmit Net Weight

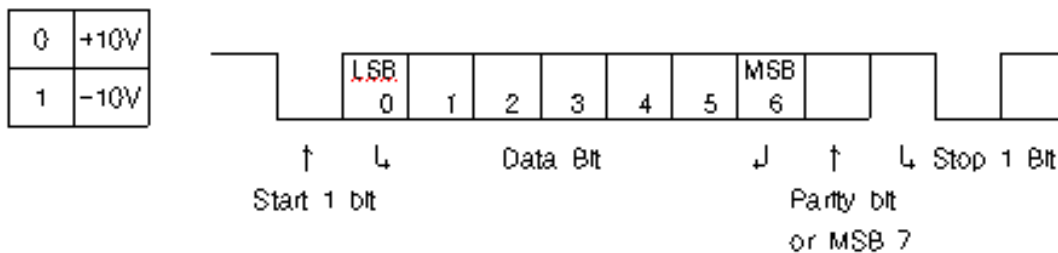
Set the delay time for transmitting DATA		
F39	0	It can set the delay time for Transmitting DATA
	~ 99	
		<ul style="list-style-type: none"> ● First Set 5(0.05 Second) ● Delay 0.01 Second PER 1 Count

5-3-1. RS-232C SERIAL INTERFACE

Because RS-232C Interface is the system that transmit the signal by Voltage Volume
It should install AC Power Cable or Electric Wire separately and the cable must be used with shield Coax Cable. And the suitable Interface Distance should be in 10M.

☒ SIGNAL FORMAT

- (1) Signal Type : EIA RS-232C
- (2) Transmit Method : FULL-Duplex, Asynchronous
- (3) Baud rate : 300, 600, 1200, 2400, 4800, 9600, 14.4k, 19.2k, 28.8k, 38.4kbps
- (4) Bit Format
 - ⓐ Data bit : 7 or 8 (No parity)
 - ⓑ Stop bit : 1 Bit
 - ⓒ Parity bit : EVEN, ODD, NONE
 - ⓓ Code : ASCII

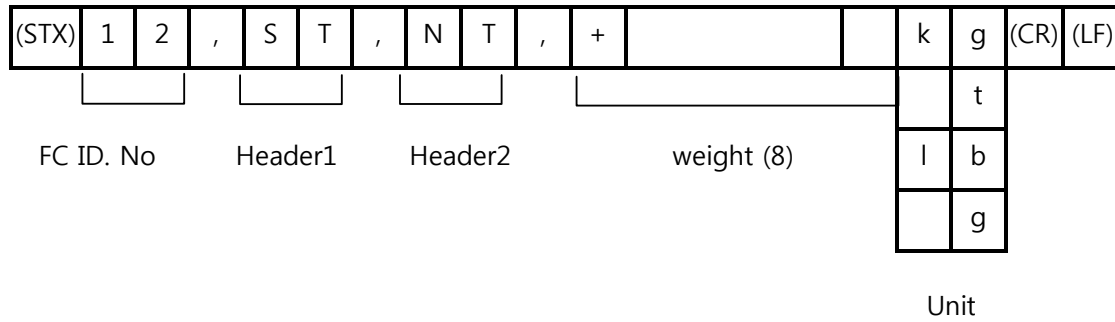


☒ STREAM MODE

It is doing Data Output in Stream Mode whenever A/D Conversion
(Reference)

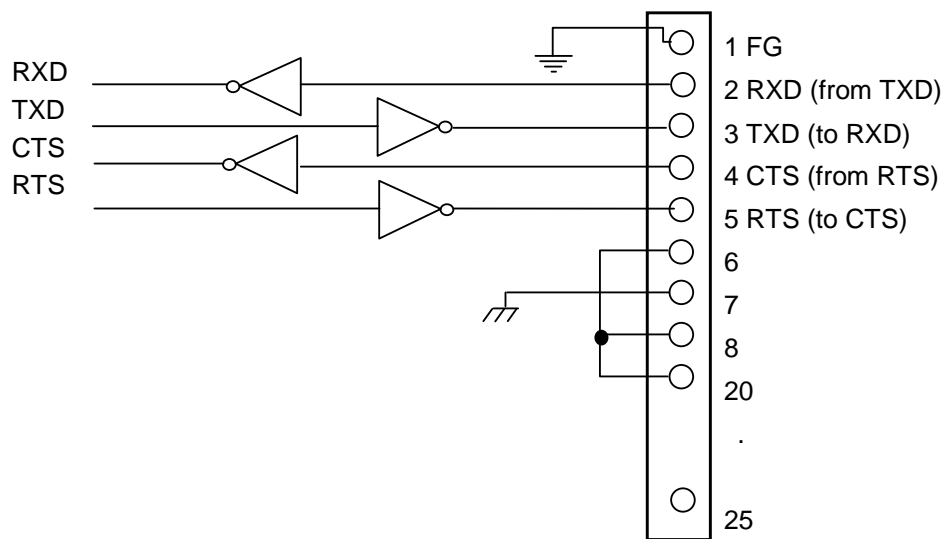
- A/D Conversion : Appr.25times/sec in lower weight.
- A/D Conversion : Appr.15times/sec in Heavy Duty weight.

☒ **DATA FORMAT**



- ▶ FC(First Character)
 - Insert in case of SETUP F34-01
- ▶ ID. No
 - Insert in case of except SETUP F90- "00"
- ▶ Header 1
 - OL : OVER LOAD
 - UL : UNDER LOAD
 - ST : WEIGHT STEADY
 - US : WEIGHT WAVE
- ▶ Header 2
 - NT : (NET WEIGHT MODE)
 - GS : (GROSS WEIGHT MODE)
- ▶ WEIGHT (8)
 - SIGN Signal (+ or -)
 - Weight (Decimal Point Included)
- ▶ DATA For Number
 - 2B(H) " + " : PLUS
 - 2D(H) " - " : MINUS
 - 2O(H) " " : SPACE
 - 2E(H) " . " : Decimal Point
- ▶ Unit
 - kg : Unit of Kg
 - t : Unit of TON
 - l b : Unit of Pound
 - g : Unit of Gram

☒ **RS-232C Circuit (25PIN -Type Female Connector)**



▣ **Receive Program example (Personal Computer)**

In case of setting of F30-00, F31-00, F32-00, F33-00, F34-00

Basic Program

```

10 OPEN "COM1: 300, E, 7, 1, DS, CS" AS # 1
20 INPUT #1, A$, B$, C$
30 PRINT A$, B$, C$
40 GOTO 20

```

5-3-2. OP-02 CURRENT LOOP

Current Loop is more stable for Electric Noise rather than RS-232C and should use baud rate by 9600 bps. And please connect AC Power Cable with other electric wire separately. Also the cable should be used with Shield Coax Cable surely.

For reference, The recommend distance is in 100 M and a wire resistance is 500Ω

☒ SINGAL FORMAT

0	20mA
1	0mA

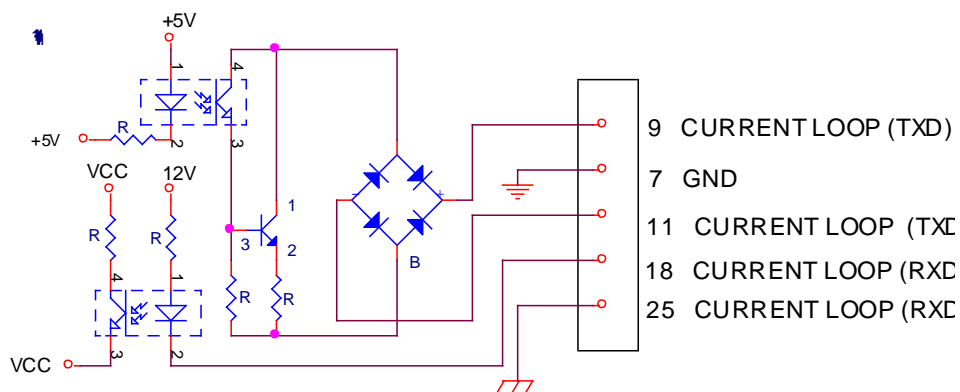
Same as 5-1 RS-232 Interface.

☒ DATA FORMAT

Same as 5-1 RS-232 Interface.

☒ 25P D-Type Female Connector

- It should use the connector like RS-232C Interface and was divided by PIN No.
- Transmit terminal was NO Polarity.
- Reception terminal was supplied with 12V for a current supply



☒ 9P D-Type Female Connector

- It can be used if a current loop instruments will be installed.
- It should use the connector like RS-422 Interface and was divided by PIN No
- Transmit terminal can be connected between No 8 and No 9 without Terminal Polarity.
- It is used for Transmit Only.

COMMAND	FUNCTION	ANSWER	
		COMMAND MODE (F32-04)	Transmit Mode
R CR LF	Request a current weight	Standard DATA FORMAT	No Receive
T CR LF	Same as [TARE] Key	ACK CR LF	NO
KT weight(6) CR LF	Same as [KEY TARE] Key	ACK CR LF	NO
G CR LF	Convert to display 'Gross Weight	ACK CR LF	NO
N CR LF	Convert to display 'Net Weight	ACK CR LF	NO
Z CR LF	Same as [ZERO] Key	ACK CR LF	NO
P CR LF	Same as [PRINT] Key	ACK CR LF	NO
A CR LF	Same as [AUTO] Key	ACK CR LF	NO
M CR LF	Auto Setting Remove	ACK CR LF	NO
ST CR LF	Same as [Sub-total] Key	ACK CR LF	NO
GT CR LF	Same as [TOTAL] Key	ACK CR LF	NO
STC CR LF	SUB TOTAL CLEAR	ACK CR LF	NO
GTC CR LF	GROSS TOTAL CLEAR	ACK CR LF	NO
HON CR LF	Hold Setting	ACK CR LF	NO
HOF CR LF	Hold Remove	ACK CR LF	NO
PN part(2) CR LF	PART Conversion	ACK CR LF	NO
CD code (6) CR LF	CODE 6 Digits SET	ACK CR LF	NO
DT YYYYMMDD CR LF	DATE SET	ACK CR LF	NO
TI HHMMSS CR LF	TIME SET	ACK CR LF	NO
RDT CR LF	REQUEST DATE	YY MM DD CR LF	No receive
RTI CR LF	REQUEST TIME	HH MM SS CR LF	No receive
RPN CR LF	REQUEST PART	PART (2) CR LF	No receive
RCD CR LF	REQUEST CODE NO	CODE (6) CR LF	No receive
RST CR LF	REQUEST SUB TOTAL	PART(2), Count(6), Weight(11) CR LF	No receive
RGT CR LF	REQUEST GROSS	Count(8) , Weight (13) CR LF	No receive
REN CR LF	REQUEST HISTOGRAM WEIGHT	Weight(7) CR LF	No receive

- F90- (01-99) SET : If you will set F90(01~99)

Then A Equipment ID NO("ID(2)") must be added to the front of all commend

Also A Equipment ID NO("ID(2)") and " , " will be transmitted to the front of answer

- The Start of Transmit/Receive Data will be done by STX (ASCII=02) in case of F34-01.

- Do not set the decimal point in the weight data received from

For example,

In case of 10.00kg of target weight(6)

Set " 001000" because the decimal point was already set in calibration mode.

- the decimal point was included in the weight data which will be transmitted.

- If it was received normally

then Answer date or ACK CR LF will be transmitted.

Otherwise, No answer or NAK CR LF will be transmitted

- All Command except of " No Receive " will be available to this weighing indicator

Without Command mode set.

But, this real meaning is nothing but to get the confirmed answer for the command

(ASCII CODE)

Hex	Character	Hex	Character	Hex	Character	Hex	Character
0(00H)	NUL	32(20H)	space	64(40H)	@	96(60H)	`
1(01H)	SOH	33(21H)	!	65(41H)	A	97(61H)	a
2(02H)	STX	34(22H)	"	66(42H)	B	98(62H)	b
3(03H)	ETX	35(23H)	#	67(43H)	C	99(63H)	c
4(04H)	EOT	36(24H)	\$	68(44H)	D	100(64H)	d
5(05H)	ENQ	37(25H)	%	69(45H)	E	101(65H)	e
6(06H)	ACK	38(26H)	&	70(46H)	F	102(66H)	f
7(07H)	BEL	39(27H)	'	71(47H)	G	103(67H)	g
8(08H)	BS	40(28H)	(	72(48H)	H	104(68H)	h
9(09H)	HT	41(29H)	)	73(49H)	I	105(69H)	i
10(0AH)	LF	42(2AH)	*	74(4AH)	J	106(6AH)	j
11(0BH)	VT	43(2BH)	+	75(4BH)	K	107(6BH)	k
12(0CH)	FF	44(2CH)	,	76(4CH)	L	108(6CH)	l
13(0DH)	CR	45(2DH)	-	77(4DH)	M	109(6DH)	m
14(0EH)	SO	46(2EH)	.	78(4EH)	N	110(6EH)	n
15(0FH)	SI	47(2FH)	/	79(4FH)	O	111(6FH)	o
16(10H)	DLE	48(30H)	0	80(50H)	P	112(70H)	p
17(11H)	DC1	49(31H)	1	81(51H)	Q	113(71H)	q
18(12H)	DC2	50(32H)	2	82(52H)	R	114(72H)	r
19(13H)	DC3	51(33H)	3	83(53H)	S	115(73H)	s
20(14H)	DC4	52(34H)	4	84(54H)	T	116(74H)	t
21(15H)	NAK	53(35H)	5	85(55H)	U	117(75H)	u
22(16H)	SYN	54(36H)	6	86(56H)	V	118(76H)	v
23(17H)	ETB	55(37H)	7	87(57H)	W	119(77H)	w
24(18H)	CAN	56(38H)	8	88(58H)	X	120(78H)	x
25(19H)	EM	57(39H)	9	89(59H)	Y	121(79H)	y
26(1AH)	SUB	58(3AH)	:	90(5AH)	Z	122(7AH)	z
27(1BH)	ESC	59(3BH)	;	91(5BH)	[	123(7BH)	{

28(1CH)	FS	60(3CH)	<	92(5CH)	₩	124(7CH)	|
29(1DH)	GS	61(3DH)	=	93(5DH)	]	125(7DH)	}
30(1EH)	RS	62(3EH)	>	94(5EH)	^	126(7EH)	~
31(1FH)	US	63(3FH)	?	95(5FH)	_	127(7FH)	DEL

5-4 SET ADDITIONAL FUNCTION

5-4-1. OP - 03 BCD OUTPUT

Parallel BCD OUT is a device to output after make the displayed weight into BCD CODE.
Also, this device is to control, Histogram, display, record through connecting with PC, PLC

* A recommend distance is in 10 M

* BCD code makes a denary into 4figure of a binary number

(Example)

In case of BCD 1987, it display **0001 1001 1000 0111**

BCD OUTPUT Weight Selecting		
F50-	⓪	Displayed Weight Value
	1	GROSS Weight
	2	NET Weight

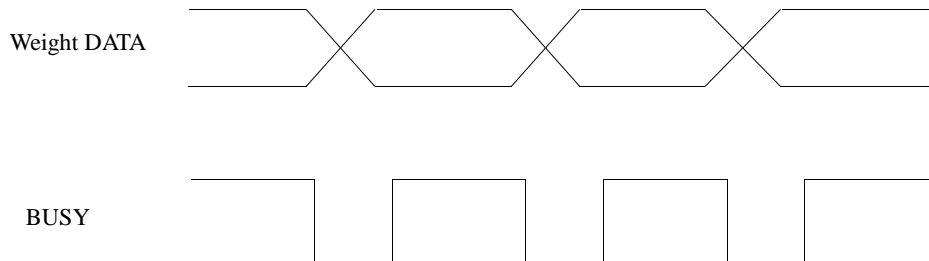
BCD OUTPUT POLARITY		
F51-	⓪	Positive Logic
	1	Negative Logic

☒ Connected Pin Diagram

PIN NO	S I G N A L
1	GROUND (GND)
2	1×10^0
3	2×10^0
4	4×10^0
5	8×10^0
6	1×10^1
7	2×10^1
8	4×10^1
9	8×10^1
10	1×10^2
11	2×10^2
12	4×10^2
13	8×10^2
14	1×10^3
15	2×10^3
16	4×10^3
17	8×10^3
18	1×10^4
19	2×10^4
20	4×10^4
21	8×10^4
22	1×10^5
23	2×10^5
24	4×10^5
25	8×10^5

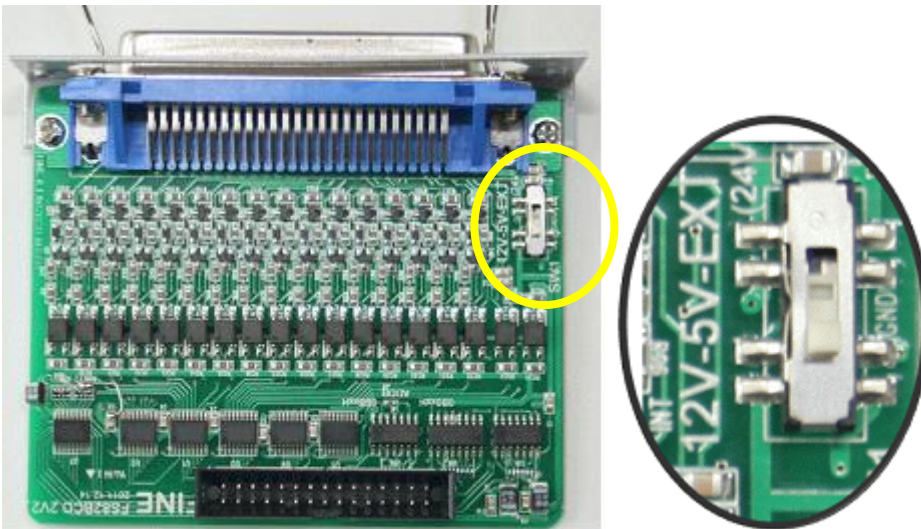
PIN NO	S I G N A L
26	Hi : Net LOW : Gross
27	
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	EX. Vcc
38	
39	EX. Vcc
40	
41	
42	Hi : Positive Polarity
43	Decimal Point 10^1
44	" 10^2
45	" 10^3
46	
47	OVER LOAD
48	
49	BUSY
50	HOLD (INPUT)

- ▶ 50 PIN CONNECTOR: CHAMP 57-40500(Ampheonol) (Female)
- ▶ TTL OPEN-COLLECTOR OUTPUT
- ▶ HOLD INPUT should be connected with OPEN COLLECTOR TYPE or Switch Earth.
- ▶ And OUTPUT DATA will hold while HOLD INPUT



- Signal Logic
 - ① BCD DATA Out → Positive logic
 - ② POLARITY → " — " = H
 - ③ OVER → " OVER " = H
 - ④ BUSY → " BUSY " = H
 - ⑤ BCD HOLD → " BUSY " = L

□ BCD Board



* Select to work it

EXT(max30V)	Using External Power. Power the voltage of 5V~30V into No 37,39 번
5V	Using Internal Power, Using TTL Level Output.
12V	Using Internal Power, 12V Power.

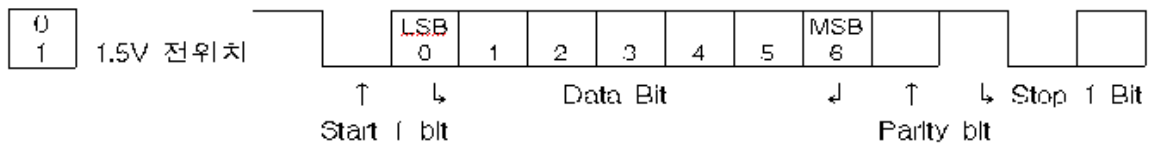
- Please use Max. Current of Each Port(H: High) with less than +20mA
- Please use Max. Current of Each Port(H: High) with less than -20mA

5-4-2. OP-04 RS-422 / 485 SERIAL INTERFACE

- RS-422/485 is to transmit signal by voltage deviation and more stable than others.
- RS- 485 should be connected as follows.
RXD(+) + TXD(+), RXD(-) + TXD(-)
- Please Specially connect them Separately disconnecting AC Power Cable or Other Wire
- Also Cable should be surely connected with Shield Twist Cable.
- Recommend Distance is in **1.2 km** .
- It should connect Termination Resistance of 300Ω on the end side of wire.

☒ SINGAL FORMAT

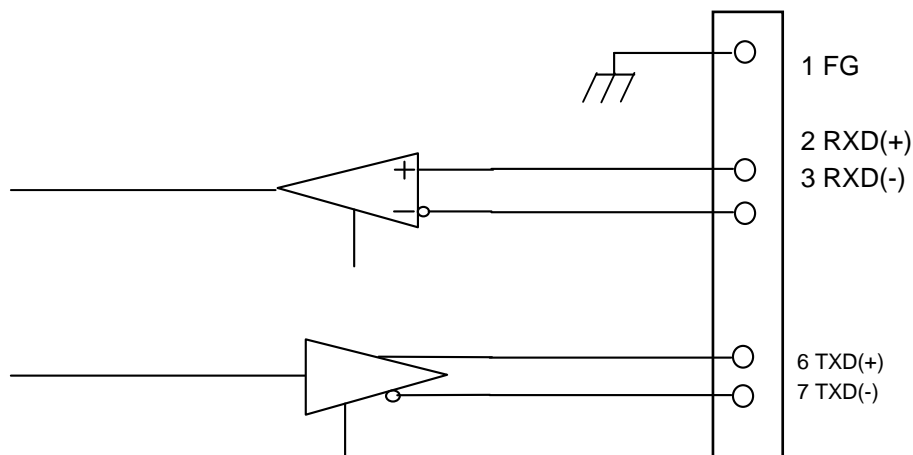
- ① TYPE : RS-422/485
- ② FORMAT : a) Baud-Rate : 300 ~ 38.4k . Selection
- b) Data Bit : 7 or 8 (NO Parity)
- c) Stop : 1
- d) Parity Bit : Even, Odd, NO Parity Selection
- e) Code : ASCII



☒ DATA FORMAT

- It is the Same with RS - 232C

☒ RS-422 / 485 Circuit (9P D-Type Female Connector)



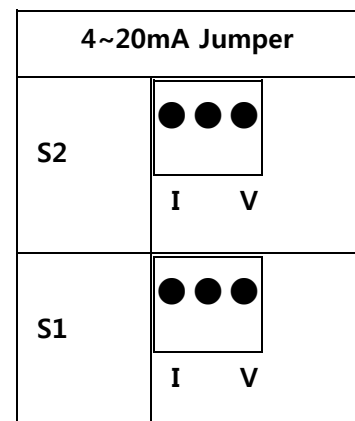
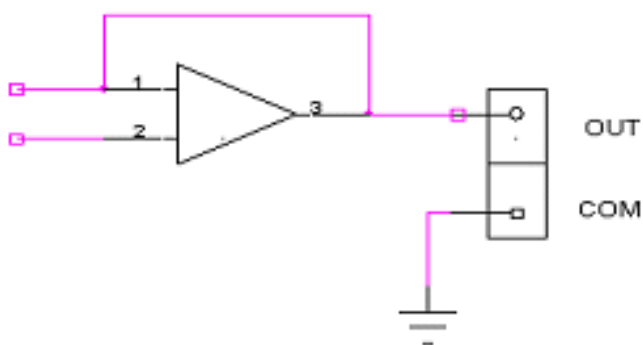
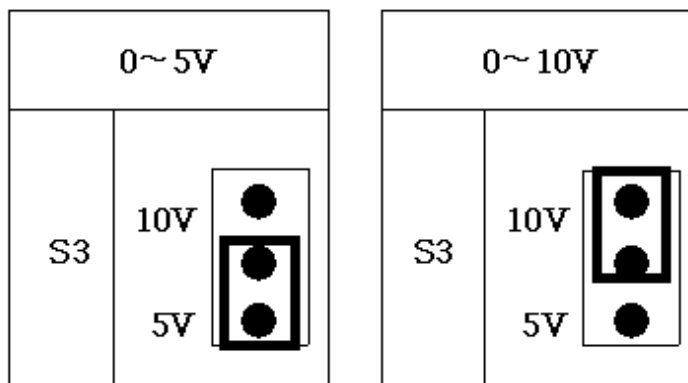
5-4-3V OP-05 voltage (0 ~ 10V) ANALOG OUT

- Voltage output occurs proportionally according to the weight range In 0V ~10V.
- Type of voltage output can be adjusted according to SET UP F60

☒ SPECIFICATION

Output Voltage	0~ 10V DC output
Precision	Max 1/3000
Min Load Impedance	More than 1 k Ω

☒ Connector Pin Diagram & Voltage out circuit



- Please be care that "COM" is not GND(Ground)
- Please connect this COM to GND of External Equipment

☒ Adjustment

- ① If the weight was 0 then 0V and was Max. Weight then 10V(5V)

※Caution

Because display weight and output voltage may be different in case of Gross/Net Weight.
Be careful that the weight setting should be checked out before.

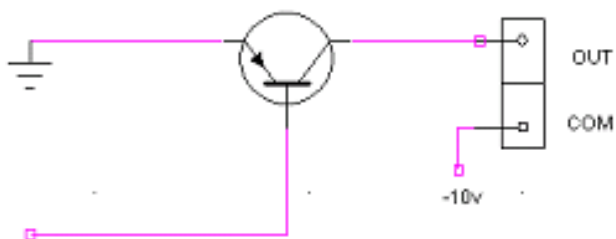
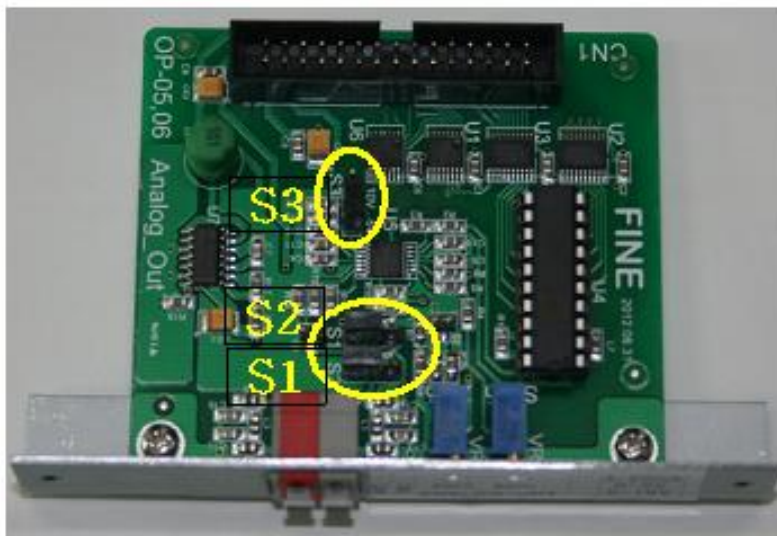
- ② When output voltage was measured by digital multi-meter then if it was different then adjust (ZERO), (SPAN) located in Analog output PCB inside Digital Indicator.

☒ How to calibrate for output rate between 0v and 10v.

- ① Adjust voltage with 0V when display weight is 0 by ZERO
- ② Adjust voltage difference with 10V when display weight is 0 and Max. weight by SPAN
- ③ Adjust voltage with 0V when display weight is 0 by ZERO.

5-4-4. OPTION-06 ANALOG OUT 4 ~ 20 mA

- This option is a device which convert the weight value to External device(Recorder P.L.C Center control so) with Analog Signal.
- The current output occurs the current according to the size of weight in 4mA ~ 20 mA
- The precision of Analog output is Max. 1/3000
- It will not be suitable for a high precision over 1/3000
- Max. Load Impedance is less than 00Ω



4~20mA Jumper							
S2	<table border="1"> <tr> <td>●</td> <td>●</td> <td>●</td> </tr> <tr> <td>I</td> <td></td> <td>V</td> </tr> </table>	●	●	●	I		V
●	●	●					
I		V					
S1	<table border="1"> <tr> <td>●</td> <td>●</td> <td>●</td> </tr> <tr> <td>I</td> <td></td> <td>V</td> </tr> </table>	●	●	●	I		V
●	●	●					
I		V					

- Please be care that "COM" is not GND(Ground)
- Please connect this COM to GND of External Equipment

※ **Caution**



Because NO 5(-) Terminal is not GND, It should not connect with GND line or BODY GND

☒ **Adjustment**

- ① If the weight was 0 then 4mA and was Max. Weight then 20mA.

※**Caution**



Because display weight and output voltage may be different in case of Gross/Net Weight.
Be careful that the weight setting should be checked out before.

- ② When output voltage was measured by digital multi-meter then if it was different then adjust (ZERO), (SPAN) located in Analog output PCB inside Digital Indicator.

☒ **How to calibrate for output rate between in 4mA ~ 20 mA .**

- ① Adjust voltage with 4mA when display weight is 0 by ZERO
- ② Adjust voltage difference with 16mA when display weight is 0 and Max. weight by SPAN
- ③ Adjust voltage with 4mA when display weight is 0 by ZERO.

5-4-5. OP-07 PRINTER

- This printer Interface have Centronics Parallel and Serial system.
- SERIAL is from 1 to 999999
- CODE figure is 6(six)digits and set according each PART.
- SUB TOTAL can be recorded Until 10figures.
- GRD TOTAL can be recorded Until 12figures.
- The data can be kept in spite of Power OFF

PRINTER SHEET SELECT		
F71-	⓪	PRINT SHEET 0
	1	PRINT SHEET 1
	2	PRINT SHEET 2
	3	PRINT SHEET 3
	4	PRINT SHEET 4

PRINT SHEET 0		
=====		
DATE :	1999-01-01	
TIME :	12:35:07	
CODE :	123456	
SERIAL	PART	WEIGHT
1	1	1.000 kg
2	1	1.100 kg
3	1	1.200 kg
4	1	0.900 kg
5	1	1.000 kg
=====		
SUB-TOTAL		
START :	1998-12-30 8:12	
END :	1999-01-01 14:26	
PART :	01	
CODE :	123456	
COUNT =	5	
WEIGHT =	5.200 kg	

PRINT SHEET 1		
=====		
DATE :	1999-01-01	
TIME :	12:35:07	
CODE :	123456	
SERIAL	PART	WEIGHT
1	1	1.000 kg
=====		
DATE :	1999-01-01	
TIME :	12:35:07	
CODE :	123456	
SERIAL	PART	WEIGHT
2	1	1.000 kg
=====		
SUB-TOTAL		
START :	1998-12-30 8:12	
END :	1999-01-01 14:26	
PART :	01	
CODE :	123456	
COUNT =	2	
WEIGHT =	2.000 kg	

PRINT SHEET 3			
DATE : 2001-01-01			
TIME : 12:35:07			
CODE : 123456			
SERIAL	PART	TARE	
GROSS	NET WEIGHT		
1	1	20.00 kg	
520.00 kg	500.00 kg		
=====			
DATE : 2001-01-01			
TIME : 12:38:07			
CODE : 123656			
SERIAL	PART	TARE	
GROSS	NET WEIGHT		
2	1	20.00 kg	
530.00 kg	510.00 kg		
=====			
SUB-TOTAL			
START : 2001-12-30 12:35			
END : 2001-01-01 12:38			
PART : 01			
CODE : 123456			
COUNT = 2			
WEIGHT = 110.00 kg			

PRINT SHEET 4	
=====	
D/T : 2002-05-21 12:35	
SERIAL :	123456
CODE :	765432
GROSS :	24.560 kg
TARE :	5.670 kg
NET :	18.890 kg
=====	
D/T : 2002-05-21 12:38	
SERIAL :	123457
CODE :	765432
GROSS :	24.550 kg
TARE :	5.670 kg
NET :	18.880 kg
=====	
D/T : 2002-05-21 12:45	
SERIAL :	123458
CODE :	765432
GROSS :	24.570 kg
TARE :	5.670 kg
NET :	18.900 kg

SET LINE FEED FOR PRINTING		
F72	0 ~ 99	1 LINE PRINT OUT PER 1COUNT(LINE FEED) * <u>FIRST SET-UP 00</u>

SET SUB TOTAL PRINTER MODE		
F73	①	SUB TOTAL PRINT SHEET 0
	1	SUB TOTAL PRINT SHERT 1(It show Max. and Min. Weight)

Sub-total PRINT SHEET 0
=====
SUB-TOTAL
START : 2000-03-28 12:34
END : 2000-03-29 9:50
PART : 1
CODE : 123456
COUNT : 10
WEIGHT : 100.000 kg
=====

Sub-total PRINT SHEET 1
=====
SUB-TOTAL
START : 2000-03-28 12:34
END : 2000-03-29 9:50
PART : 1
CODE : 123456
COUNT : 10
MIN : 9.998 kg
MAX : 10.002 kg
AVG : 10.000 kg
=====

☒ **PRINTER CONNECTOR PIN (25P D-Type Female Connector)**

PIN NO.	Contents
1	STROBE
2	D0
3	D1
4	D2
5	D3
6	D4
7	D5
8	D6
9	D7
10	ACK
11	BUSY
12	N.C
13	N.C

PIN NO.	Contents
14	N.C
15	N.C
16	N.C
17	N.C
18	GND
19	N.C
20	N.C
21	N.C
22	N.C
23	N.C
24	N.C
25	N.C

5-4-6. OP-10 BCD INPUT.

Parallel BCD input is used to change the PART from the external device.

This device make it effective to weigh a various works changing the PART with a connection of Computer, PLC, Digital Switch.

The inside circuit of Input & Output circuit use a photo-coupler and was isolated from the external

- * Recommend distance is under 10 M
- * BCD code makes a denary into 4figure of a binary number
 - BCD CODE of PART No 19 will show 0001 10001

0 = OFF, 1 = ON

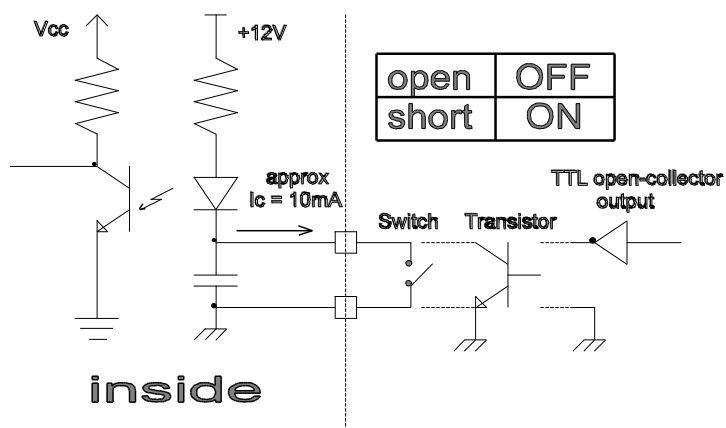
☒ 15P D-Type Female Connector

PIN NO	SIGNAL
1	1×10^0
2	2×10^0
3	4×10^0
4	8×10^0
5	1×10^1
6	2×10^1
7	4×10^1
8	8×10^1

PIN NO	SIGNAL
9	COM
10	
11	SUB INPUT 1
12	SUB INPUT 2
13	SUB INPUT 3
14	SUB INPUT 4
15	COM

- Sub Input will be used in case of Additional Sub Input except of the basic External 4 Input.

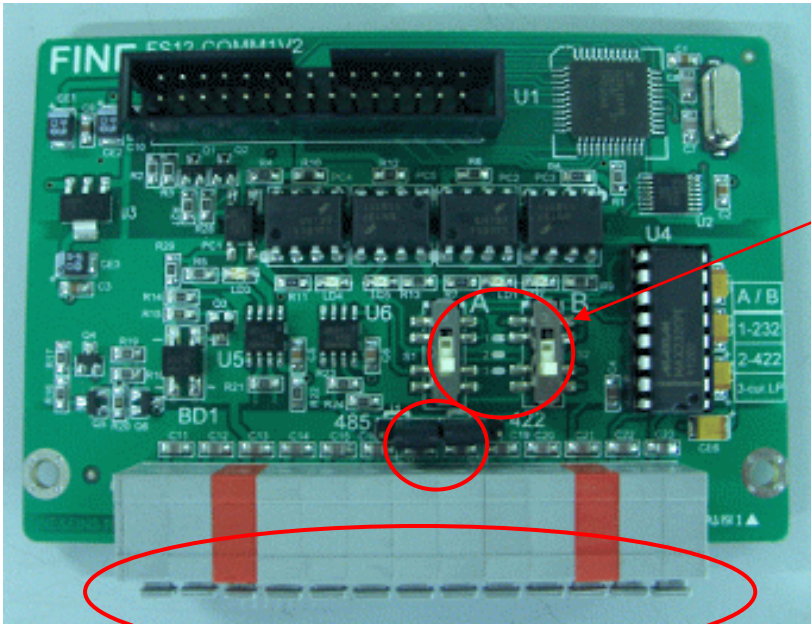
☒ BCD INPUT CIRCUIT



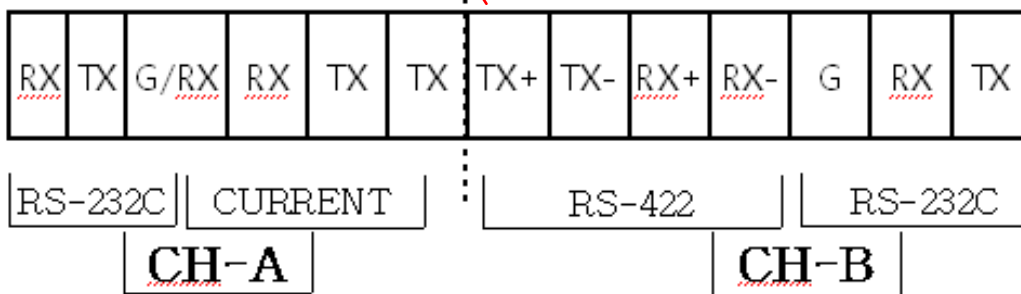
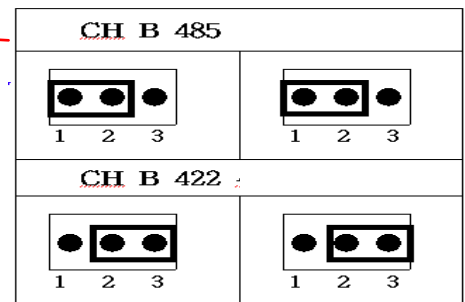
5-4-7 OP-11 CH-A, CH-B Extension Serial Communication

* It must be device which have CH-A & CH-B of Serial Interface.

CH-A = RS-232C, Current Loop



CH A	CH B
1-232	1-232
2-422	2-422
3-Current	3-Current
232C, Current	232C,422/485



Delay Time for Transmitting DATA		
F39-	0	It can transmit DATA after Time set by F-39
	99	* Initial Set 5(0.05 Second)
		* 0.01Second Delay Per 1 Count

CH-A Communication Weight Selection.		
F-78	⊙	It transmit the same weight as display
	1	It transmit the final weight
	2	It always transmit Gross Weight
	3	It always transmit Net Weight

CH-B Communication Weight Selection.		
F-79	⊙	It transmit the same weight as display
	1	It transmit the final weight
	2	It always transmit Gross Weight
	3	It always transmit Net Weight

Baud Rate.		
F-80(CH-A)	Ⓞ	300bps(Group 1)
	1	600bps(Group 1)
F-85(CH-B)	2	1200bps(Group 1)
	3	2400bps(Group 1)
	4	4800bps(Group 1)
	5	9600bps(Group 1)
	6	38.4k bps(Group 1)
	7	4800bps(Group 2)
	8	9600bps(Group 2)
	9	14.4k bps(Group 2)
	10	19.2k bps(Group 2)
	11	28.8k bps(Group 2)
	12	57.6k bps(Group 2)
13	115.2k bps(Group 2)	
It will be available to use the same Group Only for CH-A and CH-B Setting		

Parity Bit		
F-81(CH-A)	Ⓞ	EVEN Parity
	1	ODD Parity
F-86(CH-B)	2	NO Parity

Transmit Mode		
F-82(CH-A_)	①	Stream Mode : a Continuous Data output
F-87(CH-B)	1	A continuous data output when the weight is steady
	2	A continuous data output when the weight which is more than Empty was steady
	3	Data 1time output when measure finish
	4	COMMAND Mode Transmit and Receive.
	5	Serial Printer Mode ONLY(Optional)

Transmit Data Format		
F-83(CH-A)	①	ST(Header1) , NT(Header2), Weight(8), kg(Unit) CR LF
F-88(CH-B)	1	ST(Header1) , NT(Header2), Weight(8), kg(Unit), Time(6), CR LF
	2	ST(Header1) , NT(Header2), Weight(8), kg(Unit), Time(6), CR LF(CAS CI-5010A)
<p>When it will set ID of F-90 then it will be added to the first of All DATA</p> <p>However, it will not be available for F33-02 Setting</p>		

STX Attach For Transmit Data		
F-84(CH-A)	①	NO attach
F-89(CH-B)	1	First character will be transmit by 'STX'(ASCII = 02)

5-5. Equipment ID Number Set

Equipment ID		
F90	00~99	* Transmit and Receive Information have no any ID in case of "00"set * ID NO attach to the front of Transmit and Receive Format in case of input NO. ● First Setting : 00

DISPLAY COLOR SELECT				
F91-	0	RED		
	1	GREEN		
	2	YELLOW		
		ZERO	WEIGHING	STEADY
	3	RED	YELLOW	GREEN
	4	GREEN	RED	YELLOW
	5	YELLOW	RED	GREEN
	6	RED	GREEN	YELLOW
	⑦	GREEN	YELLOW	RED
	8	YELLOW	GREEN	RED

A/D Conversion Times Per Second				
F94	0	25times	⑤	120times
	1	30times	6	150times
	2	50times	7	180times
	3	60times	8	200times
	4	100times	9	240times

DATE SET	
F95	<p>How to set</p> <p>b) CLR Key after input 95 in order to go to F95 in SET UP Mode.</p> <p>c) SET after input your target Date.</p> <p>For example.</p> <p>a) Current Date : 970930(30th. Sep. 1997)</p> <p>b) Target Date : 010214(14th. Feb. 2001)</p> <p>c) SET Key(3second Pressing) > F01-00 > 9 of key > 5 of key > CLR</p> <p>d) 01 of key > 02 of key > 1 of key > 4 of key > SET.</p>
<p>※ DATE and TIME Chip is the standard</p> <p>※ TIME can input/output by 24hour Rule</p>	

TIME SET	
F96	<p>How to set</p> <p>b) CLR Key after input 96 in order to go to F96 in SET UP Mode.</p> <p>c) SET after input your target Time.</p> <p>For example.</p> <p>a) Current Date : 172530(30sec / 25min / 17hr)</p> <p>b) Target Date : 215556(56sec / 55min / 21hr)</p> <p>c) SET Key(3second Pressing) > F01-00 > 9 of key > 6 of key > CLR</p> <p>d) 2 of key > 1 of key > 5 of key > 5 of key > 5 of key > 6 of key > SET.</p>
<p>※ DATE and TIME Chip is the standard</p> <p>※ TIME can input/output by 24hour Rule</p>	

A/D(Analog and Digital) Conversion for basic ZERO Value	
F98	It displays the range of ZERO Value which digital indicator needs. It can compare this value to a current basic zero value for a checking a load cell Error out.



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