

Digital Weighing Indicator

FINE

Instruction Manual

(FS-2101C)



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CHAPTER 1. PREFACE

1-1. INTRODUCE

Thank you very much for your purchasing FINE Digital Weighing Indicator of **FS-2101C**. This Instruction Manual will make you lead to use **FS-2101C** with FINE speed, accuracy, reliability. **FS-2101C** is designed to withstand harsh environmental conditions and is designed for flawless Performance in your demanding application.

FS-2101C 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

The Application of **FS-2101C** Model will be use for a filler weighing, discharging, Accumulated weighing, checking the weight by using 3step control(1st, 2nd, 3rd) Signal.

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 OF MANUAL WEIGHING
2. EQUIPMENTS FOR AUTO FILLING WEIGHING
3. EQUIPMENTS FOR DISCHARGING WEIGHING
4. CHECKING A SIMPLE WEIGHING
5. RECORDING-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.

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.

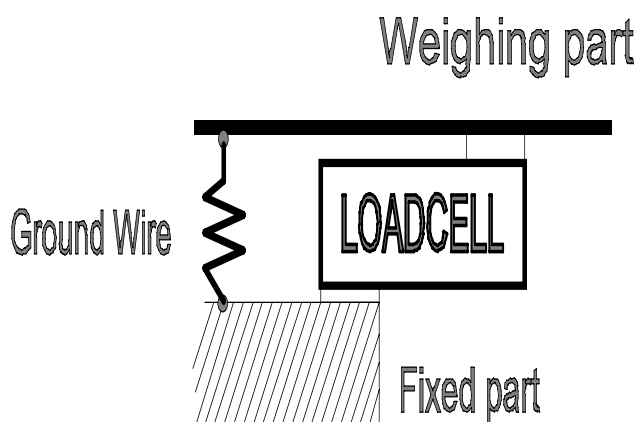
◆ Temperature Conditions.

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.

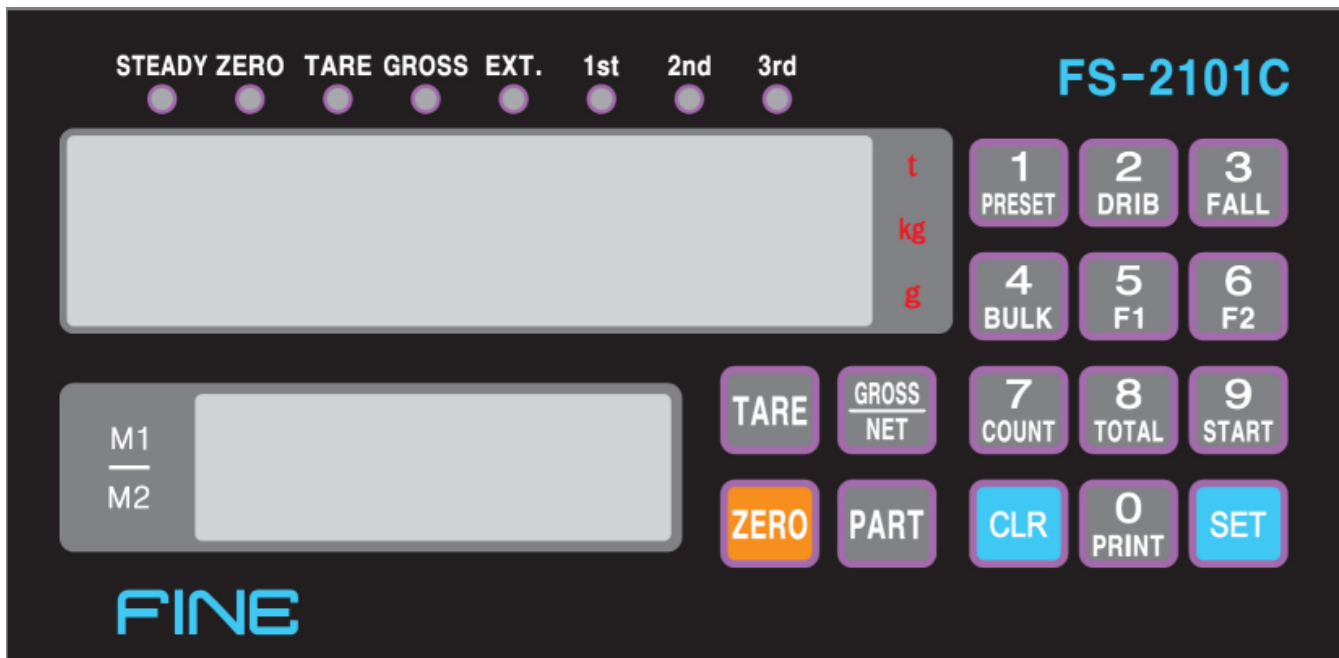
- Available to use the same load cell of 8pcs (300Ω standard)
- A ground should be installed horizontal
- Installing over 2pcs of load cell and connect each line in parallel and Insert a variable resistor under 50Ω in EX + line and minimize a output Accuracy of load cell.
- It may occur a weight error 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 192 x 96 Panel Insertion)
- 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** timer guards for self-diagnostics.
- Set up to Max. 1/20,000 display resolution
- Function available to change the unit value such as **kg, ton**
(In case of Serial Interface & Printer)
- 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. 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 when the weight is empty.
ZERO Lamp can be adjusted by SET UP F13,F14,F15 F03.
It will be the standard of weight decision when running AUTO Function.
- ▼ TARE : This Lamp will be ON when TARE Weight preset.
(SET-UP F12 Reference)
- ▼ GROSS : This Lamp will be ON when a current weight is Gross Weight.
It will be possible to show TARE when set up TARE.
- ▼ EXT. : This Lamp will be displayed with external input
- ▼ 1 ST Signal It will be ON when 1 ST Control Relay runs.
- ▼ 2 ND Signal It will be ON when 2 ND Control Relay runs.
- ▼ 3 RD Signal : It will be ON when 3 RD Control Relay runs.

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 20 No.

- Checking PART : **PART Key** → **CLR Key**

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

- ☞ **DRIB Key** : It can preset the drib weight.
 - **DRIB + (Drib Weight) + SET**
 - It can not put the weight value less than Drib Weight
 - It can not put the weight value less than Fall Weight

- ☞ **FALL Key** : It is Fall weight that was fallen after the hopper gate was closed.
 - **Fall +(Fall weight) + SET**
 - Refer to SET UP F43 for Fall Compensation.
 -

- ☞ **BULK Key** : It can preset the Bulk weight.
 - **BULK + (Bulk Weight) + SET**
 - It can use this weight by 1st control relay in 3step Filling Weighing.
 - It can use this weight by Filling control relay in 2nd Discharge Weighing.

- ☞ **F1,F2** : This keys appear a various data as the end-user demands.
 - Available to use the end-user required function 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** : The function to delete and print Sub-total and TOTAL
 - Delete : **CLR + TOTAL + SET (SUB-Total Delete)**
CLR + TOTAL + TOTAL + SET (TOTAL Delete)
 Then TOTAL,SUB-total will be deleted automatically.
 - **Print: TOTAL + PRINT (SUB-Total PRINT)**
 - **TOTAL + TOTAL + PRINT(TOTAL PRINT)**
 - Available to delete automatically when printing (SETUP F18 Reference)

- ☞ **START/STOP Key** : It was used to start or stop the weighing in Sequence Control system
 - No use for a simple reference MODE.
 - Start/Stop can be controlled by External input.
 - Available to set up a existed weight with ZERO, TARE in doing start
 -

- ☞ **PRINT Key** : This Key is to Transmit, Totalize, Print all Data in manual.
 - Available to work it in manual while SET UP F46-00
 - Please push **CLR + Print when deleting the last TOTAL Weight Data.**
 - Unavailable to work in case of Re-power Input , changing the PART
 - It also will be available for 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.

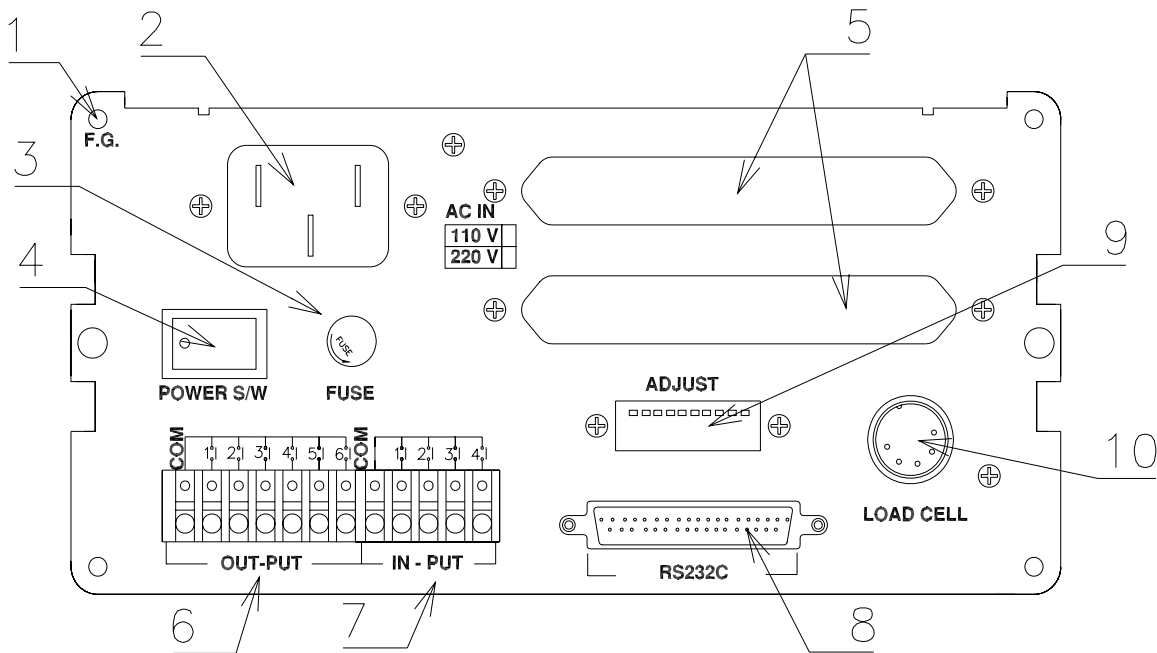
CLR Key is used for the below application.

- 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, 4Chapter 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 with multiple.
 Before Installation then check out the power voltage.
 Change 220V terminal into 110V when it change the power voltage.
 (The first power supply was made by 220VAC.)

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.

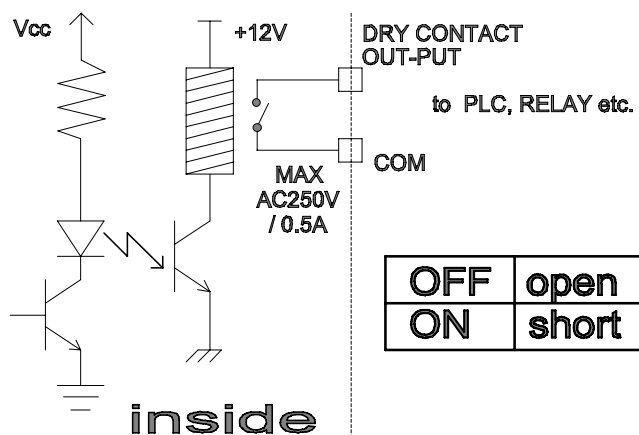
5. DATA OUT (Option Board.) :
 Serial Communication. RS422, BCD In/Out, Analog Out 0~10V, 4~20 mA
 Print Out(Serial Print / Centronics Parallel)

6. OUT-PUT :

It can connect between COM and each Output Terminal by no voltage contact.
Each Output Terminal Function can be selected by SET UP F40.

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

Max earth capacity : AC250V / 0.5A



7. IN-PUT :

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

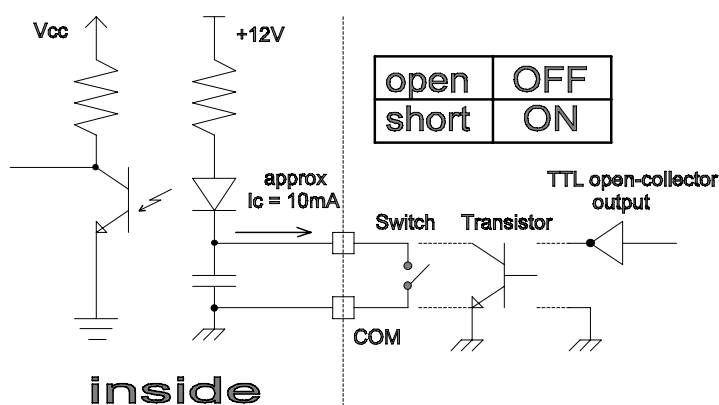
The functions of input terminal is to choose it by SETUP F16

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.



8. RS-232C (25P D-type Female) : (OP-01)

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 - No 6 : ZERO Adjust , No 7 - 8: SPAN Adjust , No 10 : Calibration Lock
- The Functions of each input terminal can be selected by SETUP F16

1-6. SPECIFICATION

1. Analog Input & A/D Conversion

Input Sensitivity	0.2 /D
ZERO adjustment Range	-4mV ~ 42.0mV
Load cell excitation	DC 10V (± 5 V)
Max Input voltage	32mV
Temperature Coefficient	± 20 ppm / °C
INPUT Noise	± 0.5 P.P
INPUT Impedance	10 (MAX)
A/D Converter	130,000 Count
Non-Linearity	0.005 F.S

2. DIGITAL SECTION

MAX.DISPLAY	"1000000"
MIN.DIVISION	x1, x2, x5, x10, x20, x50
DISPLAY UNIT	7-Segment, 7digit Highly bright fluorescent tube
KEY BOARD	Numerical Key and Function Key(0-9,CLR,SET/CLR)
Data Back-up	APPR.10 YEAR

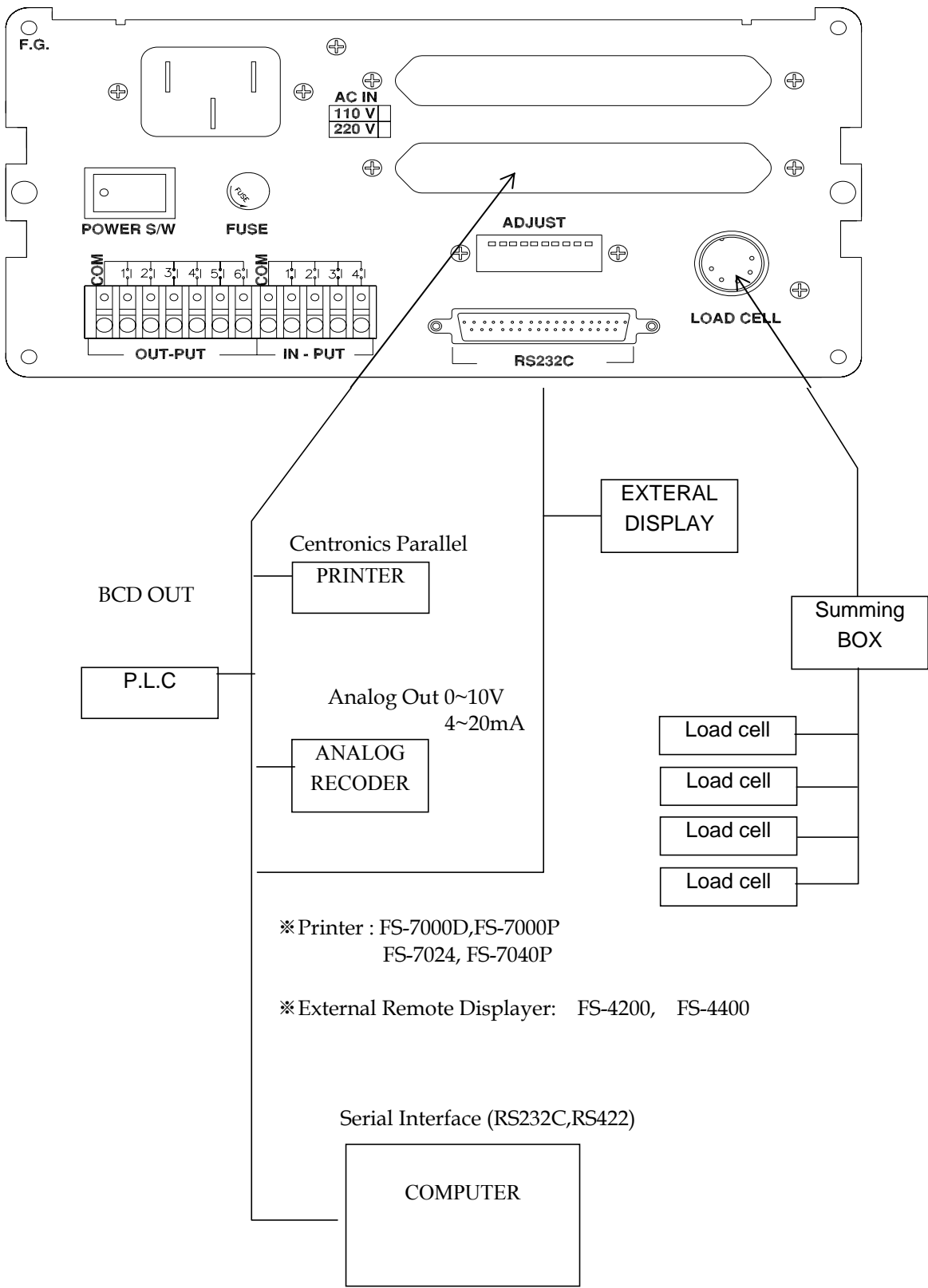
3. GENERAL

POWER	AC110 / 220V (±10%), 50 / 60Hz, 10VA
PRODUCT WEIGHT	NET 2.3kg BOX 3.3kg
Operating Temperature	-10 °C ~ 40 °C
Operating Humidity	85%RH MAX (Non-Condensing)
External Dimension	193.6 x 98 x 166 (mm)

4. OPTION

OP-01	STANDARD
OP-02	Serial I/F : CURRENT LOOP
OP-03	Parallel I/F : BCD Out
OP-04	Serial I/F : RS422, RS485
OP-05	Analog Output : V/out (0-10V / 10V-0V)
OP-06	Analog Output : I/out (4-20mA / 20-4mA)
OP-07	Print I/F : CENTRONICS Parallel
OP-10	Parallel I/F : BCD In PART

1-7. How to connect to External Equipment



CHAPTER 2. INSTALLATION

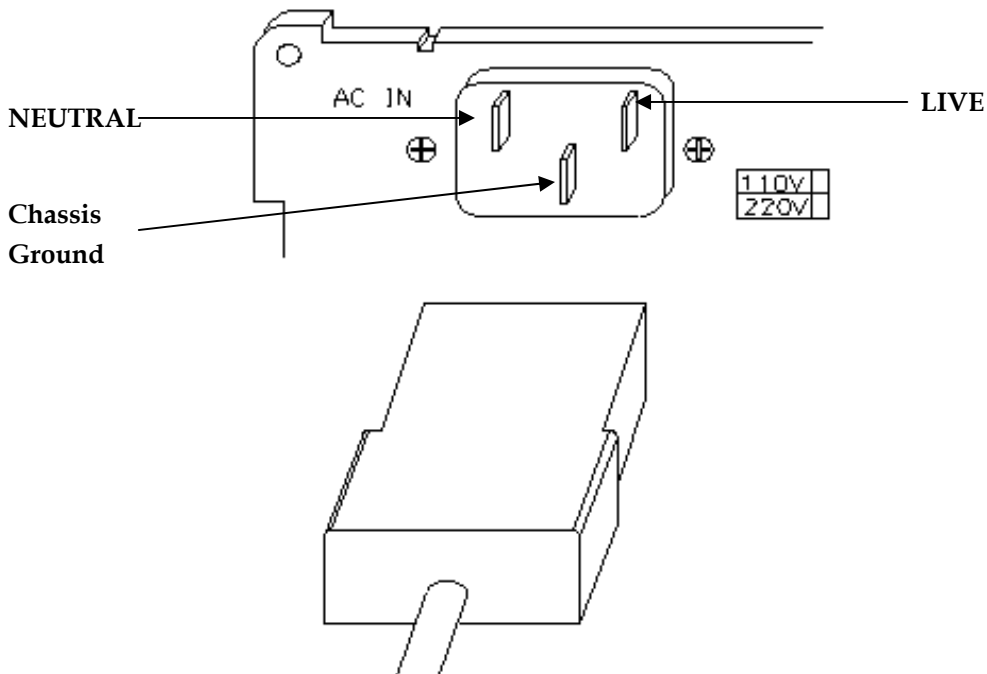
☞ Installation Caution.



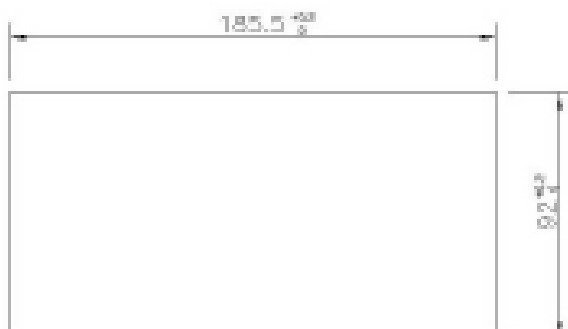
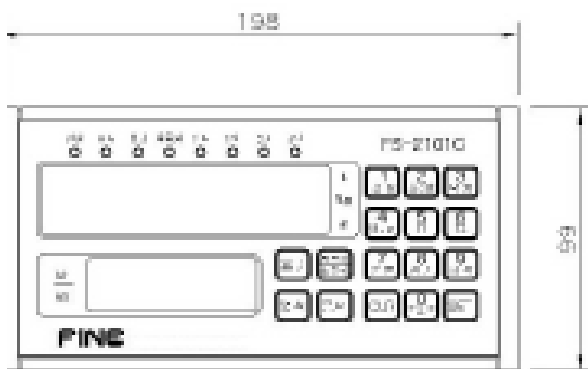
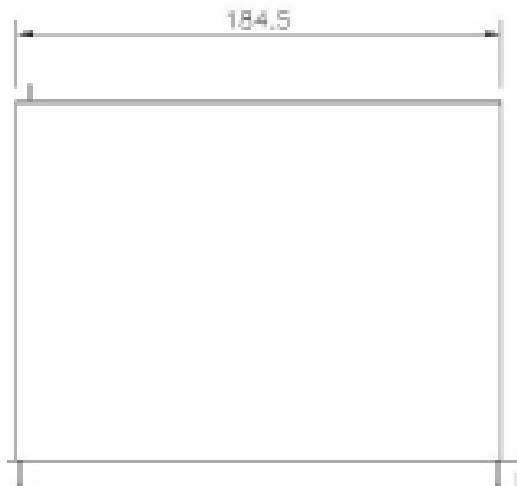
- Be careful for avoid from a strong impact, vibration. temperature. water, wind.
- Be careful for avoid Installation from a high moisture around.
- Be careful for avoid Installation from a high temperature fluctuation.($\pm 10^{\circ}\text{C}/\text{h}$).
- Be careful that the power should be isolated 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.

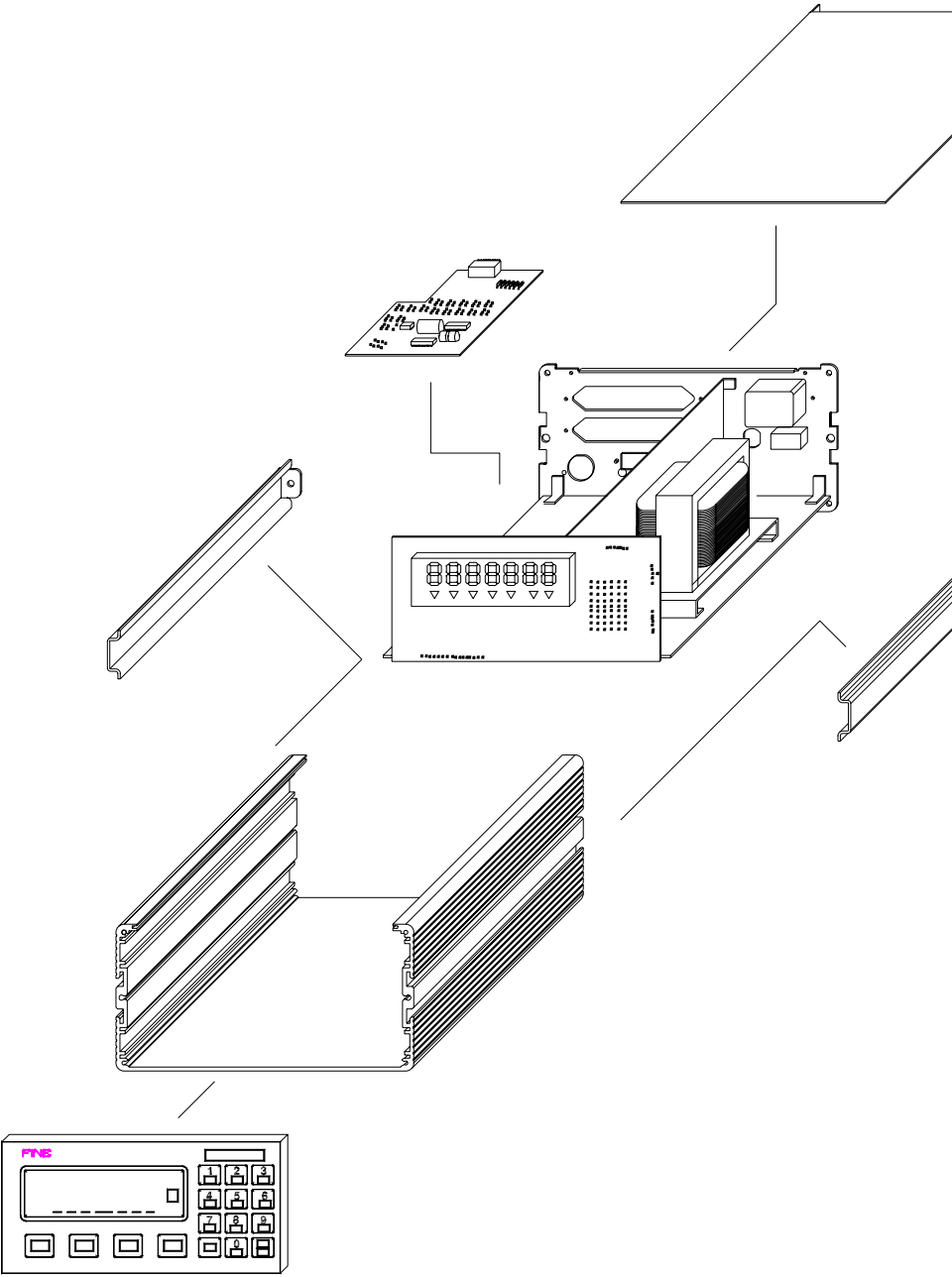
- Power Code Connector : 1EA
- FUSE : 2EA (PIPE TYPE 250V 0.3A SMALL TYPE)
- LOAD CELL Connector : 1EA (N16-05)
- Instruction Manual : 1Copy
- Adaptable Connector for Option Connection.



2-1.Out-Dimmmension & CUTTING SIZE



2-2. ASSEMBLE DRAWING



2-3.HOW TO CONNECT TO LOAD CELL

1. Recommend Load cell

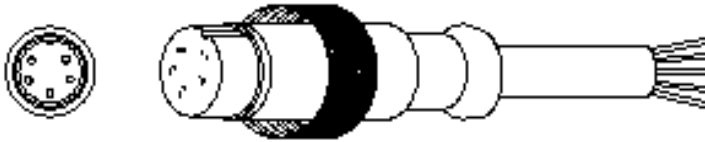
The Rated Output(R.O) of a load cell should be 1mV/V ~ 3mV/V
Specially FINE Cell is 2 mV/V ±0.005 and can be supplied together.

■ **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. 8pcs Load cell in parallel.(Max 300Ω)



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 d	Red	White	Green	Blue	Shield	
Interface	Red	Black	Green	White	Shield	
Tedia C e	Green	Black	Red	White	Shield	

l connector Standard : N16-05.

2-4. ERROR & CLEAR

Error	Source	Clear	Reference
Unstable Weight	<ul style="list-style-type: none"> ① Load cell Broken. ② Load cell Insulation Resistance Error ③ Touching to a moving frame. ④ Touching to a moving frame 	<ul style="list-style-type: none"> ① Measure the rated output of load cell. ② Measure load cell Insulation resistance 	<ul style="list-style-type: none"> ① Input resistance : about 400 Ω ② output resistance about 350 Ω ③ Insulation resistance : 100
Increasing weight or Not return to ZERO	<ul style="list-style-type: none"> ① Load cell broken. ② Load cell not connecting 	<ul style="list-style-type: none"> ① Measure load cell insulation resistance (normal : 100 or OL display) ② check load cell connector 	
Minus Weight(-)	<ul style="list-style-type: none"> ① Rated output of load cell (SIG +, SIG -) exchanged 	<ul style="list-style-type: none"> ① check load cell connector. 	ERR-55.
"bAd"	<ul style="list-style-type: none"> ① Load cell Broken. ② Connect Condition. ③ Out of basic ZERO 	<ul style="list-style-type: none"> ① check load cell. ② check load cell connector. ③ adjust ZERO(5000~50000) 	
"UL" (Under Load)	<ul style="list-style-type: none"> ① Load cell Broken. ② Connect Condition. ③ Out of basic ZERO 	<ul style="list-style-type: none"> ① check load cell. ② check load cell connector. ③ adjust ZERO(5000~50000) 	
"OL" (Over Load)	<ul style="list-style-type: none"> ① Load cell Broken. ② Connect Condition. ③ Excessive Weight. 	<ul style="list-style-type: none"> 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

▣ What is zero adjustment.?

ZERO is the standard point which can indicate the weight..

Digital Indicator displays the weight as much as amplified analog value of ZERO from load cell.

It displays "UL" if the actual weight of display was less than ZERO which FINE indicator demands.

Otherwise, it displays "bAd" if the actual weight of display was more than ZERO.

Then FINE indicator will not run when it displays " UL "or "bAd"

☞ ZERO RANGE Which FINE Indicator demands.

Adjust the value displayed to **"test1"** closed to 1000 - 20000 (Recommend 5000) by
(Dip-Switch No 1- No 6)

1. HOW TO ADJUST ZERO POINT

If you power in Digital Indicator while pressing No 1 Key of keypad

Then it displays " test "

Then if pressing No 1key again then it displays "test1" and displays " ZERO POINT ".

Then if it does not display " ZERO POINT" then turn " ON " of all No 1 ~ No 6 Dip-Switch on real Size panel of Digital indicator and adjust ZERO POINT closed to around 5000 by Dip-Switch.

For example,

- Power In while pressing No 1key of Keypad
- Press No 1key of keypad again.;
- Adjust ZERO POINT closed to around 5000 by Dip-switch on the real panel.

2. How to adjust a Dip-switch

Small Amplified ←-----→ Large Amplified								
	1	2	3	4	5	6	Zero point Amplified	Amplified Example.
1	ON	ON	ON	ON	ON	ON	0	0
2	OFF	ON	ON	ON	ON	ON	1	-980 Amplified Volume
3	ON	OFF	ON	ON	ON	ON	2	-1960 Amplified Volume
4	OFF	OFF	ON	ON	ON	ON	3	-2940 Amplified Volume
5	ON	ON	OFF	ON	ON	ON	4	-3920 Amplified Volume
62	OFF	ON	OFF	OFF	OFF	OFF	61	-59980 Amplified Volume
63	ON	OFF	OFF	OFF	OFF	OFF	62	-60760 Amplified Volume
64	OFF	OFF	OFF	OFF	OFF	OFF	63	-61740 Amplified Volume

- Adjust ZERO POINT by NO 1 ~ NO 6 Only of Dip-Switch.
- Do not adjust ZERO POINT by NO 7 and NO 8 which can adjust for SPAN adjustment.
- NO 9 of Dip-Switch is to Self- Test Digital Indicator through the input signal(SIG +, SIG-) of Load cell and always turn OFF NO 9 of Dip-Switch.
- NO 10 of Dip-Switch is to prohibit or permit "Calibration" which can not be access to any persons.

For example,

- (1) A current display of digital indicator = 317720.
- (2) No 1 ~ No 6 of Dip-Switch = ON.
- (3) Then how ZERO Point can be closed to around 30000?
- (4) If Amplified Volume was 980 if NO1 key was OFF then The Amplified Volume of Each Dip-Switch was as follows.

Dip-Switch	1	2	3	4	5	6
Amplified/V	12540	25080(12540X2)	50160	100320	200640	401280

Then if NO 1,NO2,NO3,NO5 of Dip-Switch was OFF
 (12540+25080+50160+100320+200640+401280=288420)
 and ZERO POINT will be 29300(317720-288420) closed to around 30000.

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 10 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/CAL** key for 3second, It will display "**St. CAL**"

Press SET/CAL 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/CAL** key.

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

- For the next Step : Press **SET/CAL** 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/CAL 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/CAL** key after inputting discretion number.

♣ Do not excess (A division ÷ Max. Weight) with over **1/20,000**(0.00005)

If exceeding over **1/20,000**, it will display "**Err 01**".

👉 3Step

A step to check the zero conditions of Indicator.

After appearing "**dEAd**", the discretion number(Max.5digits) will appear.

If the present number is closed by 30,000, please press **SET/CAL key**.

If a discretion number did not display or was over 20000,

Do it as the zero adjustment instruction again.

☞ 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 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 test 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 SET/CAL	d 50
	Adjust a division by pressing 0 key	d 01
	Setting Decimal point by 3key	d 0.01
2 STEP	Press SET/CAL	c 8 0.00 after displaying CAPA
	Press 5000 by numeral Key	c 5 0.00
3 STEP	Press SET/CAL	d 4879 after displaying dead
	* Adjust ZERO POINT if this value was not closed to 5000 ~ 50000	
4 STEP	Press SET/CAL	s 50.00 after displaying SPAn
	Press 5000 by numeral Key	
5 STEP	Press SET/CAL	Load
	Load test weighter on the platform	
6 STEP	Press SET/CAL after 3second	0. 97482 1.
7 STEP	Press SET/CAL	End
	Press SET/CAL after unloading Test Weighter.	TEST " 7segment " in display. After "FinE"
	In the display	0.0 then it will be normal 1.0

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 Interval/Max. Display weight) was set over 1/20,000 resolution.
- ②Adjust : Set under 1/20,000 resolution(A Interval/Max. Display weight)

※ **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 : Set Standard Test weight for span adjust into less than 5% of Max CAPACITY

※ **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
Or the amplification Volume of Analog circuit inside was more than.
- ②Adjust :
 - Please check it if the actual weight was more than Standard Test weight or not
If it did so, please adjust the standard Test weight into the value set up.
 - If it continue to display ERR--05, Adjust NO 7,8 of Dip-Switch on the rear panel.

For a reference,

NO 1 ~6 of Dip-Switch is to adjust ZERO.

NO 7 ~8 of Dip-Switch is to adjust SPAN

Also because ZERO was changed according to NO 7 ~8 of Dip-Switch,

Please adjust ZERO again as **3-1 ZERO Adjustment**

- The way to use the Dip-Switch.

NO7	NO8	Amplified Volume	
ON	ON	Small	1times
OFF	ON	Normal	2times
ON	OFF	Big	3times
OFF	OFF	Very Big	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 normal or nor.

※ 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 7,8 of the Dip-Switch on the rear panel.
For a reference,
NO 1 ~6 of Dip-Switch is to adjust ZERO.
NO 7 ~8 of Dip-Switch is to adjust SPAN
Also because ZERO was changed according to NO 7 ~8 of Dip-Switch,
Please adjust ZERO again as **3-1 ZERO Adjustment**

The way to use the Dip-Switch.

NO7	NO8	Amplified Volume	
ON	ON	Small	1times
OFF	ON	Normal	2times
ON	OFF	Big	3times
OFF	OFF	Very Big	4times

OFF
ON

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

- ※ If it continue to display ERR--06 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
F 02	Weight BACK-UP	Normal, 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)
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
20 Group – Control Way		
F 21	F1 Key Function	No define or set
F 22	F2 Key Function	No define or set
F 28	LOW weighing deviation setting.	LOW permit deviation setting by %
F 29	HIGH weighing deviation setting	HIGH permit deviation setting by %
30 Group – Serial Interface Specification		
F 30	Baud Rate	300,600,.,. 38400 bps
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 RS422(485)	Available(RS422,RS485), Unavailable
F 36	Select Interface Weight	Always transmit Net/Gross Weight
F 37	Set Transmit Comma(,)	Select “,” or not.
40 Group – Signal Control Setting.		
F 40	Weighing Mode Setting.	Simple Comparison, Weight Judgment Control
F 41	Delay Timer for Finished, High, Low Signal	0 ~ 9.9 second setting.
F 42	Run Timer for Finished, High, Low Signal	Continuous or 0.1~9.9 second setting
F 43	Fall compensation Way Setting.	Useless, 5, 10, 20, 50times Compensation
F 44	Weight Judgment Prohibited Timer	Useless, 0.1 ~ 9.9 second setting
F 45	Weighing Range Setting	+ Range , Absolute, - Range
F 46	Finished Weight Judgment Way Setting	Manual, Steady, steady + time, time

	Function	Contents
40 Group –Signal Control Setting		
F 47	Display setting for Finished Weight	No use , Fixed Finished Weight
F 48	ZERO or TARE setting by START Key	No available for simple control signal
F 49	Weight setting for a filling Limit	Setting of F49
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
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)
90 Group		
F 90	Equipment ID	00~99
F 91	Set Display Color	00 ~ 08
F 92	Set language	0 ~ 1
F 93	Set Display LCD	0 ~ 7
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

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
※. In case of NORMAL SET UP It will not record the weight which was out of power and it must use digital indicator After removing the material on the platform.		
※. In case of BACK-UP SET UP. It will record the weight which was out of power.		
※ (KEY) 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
※ What is ZERO Tracking ? 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		

Set Motion Band			
F04	0	0.5 Digit	※ Motion Band ? 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.
	①	1 Digit	
	2	2 Digit	
	3	4 Digit	
	4	8 Digit	
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.			

Set Auto Zero Range		
F05	0~99	If it displays the remained weight after discharging and displays steady then the remained weight will be "o". ● First setting 00
Example, If Gross Weight was set by 3kg/1g and F05 was 10 then ZERO will run automatically until 1~10g		

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.			


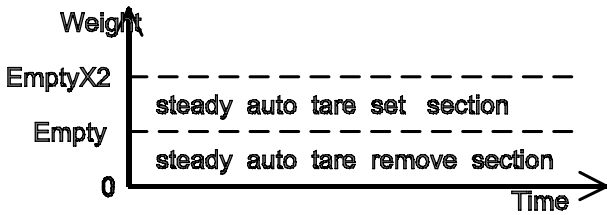
Set ZERO Range		
F07	①	In 2% of Max. Weight
	1	In 10% of Max. Weigh
	2	In 50% of Max. Weight
	3	In 90% of Max. Weight
ZERO Range can be set by ZERO Key and External ZERO Input. ※ Caution. If zero range was set by 50% and 50kg of 100kg load cell was ZERO then if the actual weight will be loaded until 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

5-2 . SET BASIC FUNCTION

Set Keypad Lock		
F10	①	All key available to access
	1	Not available for TOTAL, START, PRINT, TARE, GROSS/NET Key
	2	Not available for all key except of ZERO Key
	3	Not available for all 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 was steady.
	①	ZERO and TARE Key run when the weight was either steady or 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. 
	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 
※ TARE of F12-02 or F12-03 will be same with F12-00 Function.		

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 range of EMPTY(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	⓪	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	HOLD(LEVEL)
	6	ZERO	TARE	PRINT	HOLD SET/Remove
※ 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
	1	It delete automatically when Sub-Total, Gross + Print

F1 Key Function		
F21	Ⓞ	NO Available
	1	Display Date
	2	Display Time
	3	Display Date and SET
	4	Display Time and SET
	5	Display Batching Cycle Frequency of Sub-Total
	6	Display Batching Cycle Frequency of Sub-Total
	7	Display Sub-Total
	8	Display Gross-Total
	9	Display Working Start Date
	10	Display Working Finish Date
	11	Display Working Start Time
	12	Display Working Finish Time
	13	Input Code Number.

F2 Key Function		
F22	Ⓢ	NO Available
		The below function was the same with F1 Function.

F3 Key Function		
F23	Ⓢ	NO Available
		The below function was the same with F1 Function.

LOW weighing deviation setting.		
F28	0.00%	If the actual weight was different with setting, the Gap weight of LOW can be set by this function Ex) Target : 100.0kg, The Gap weight : 1kg then 1.100=1% then 1.00 input. ● First Setting : 3.00%
	99.9%	
LOW Relay will output if the actual weight was over LOW setting weight		

HIGH weighing deviation setting.		
F29	0.00%	If the actual weight was different with setting, the Gap weight of HIGH can be set by this function Ex) Target : 100.0kg, The Gap weight : 1kg then 1.100=1% then 1.00 input. ● First Setting : 3.00%
	99.9%	
HIGH Relay will output if the actual weight was over LOW setting weight		

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

SET DISPLAY COLOR				
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
		GREEN	YELLOW	RED
	8	YELLOW	GREEN	RED

SET LANGUAGE	
F92-	SET LCD DISPLAY LANGUAGE
	KOREAN
	1 ENGLISH

SET LCD DISPLAY		
F93-		Display the Setting Value for High, Low (High: upside, Low: down)
	1	Display the Setting Value for High, Low (Low: left, High: right)
	2	Display the Setting Value High, Low as bar graph
	3	Display Low, High, Part, Total Value (Low: Upside-left, High : Upside-right) (Part : Down - left, Total Weight : Down - right)
	4	Display Low, High, Fall Value (High: Upside-left, Fall : Upside-right) (Low : Down-right)
	5	Display Low, High, Fall , Part Value (High: Upside-left, Fall : Upside-right) (Low : Down – left, Part : Down-right)
	6	Display Low, High, High Fall , Low Fall Value (High: Upside- l`eft, High Fall : Upside-right) (Low: Down-left, Low Fall : Down-right)
	It will be applied after setting F40-6,7 (Refer to function F40)	
	7	Display Low, High, High Fall , Low Fall Value (Low : Upside - left, High: High -right) (Low Fall : Down - left, High Fall : Down - right)
	It will be applied after setting F40-6,7 (Refer to function F40)	

DATE Amend.	
F95	<p>How to amend</p> <ul style="list-style-type: none"> a) CLR Key after input 95 in order to go to F95 in SET UP Mode. b) SET after input your target Date. <p>For example.</p> <ul style="list-style-type: none"> a) Current Date : 970930(30th. Sep. 1997) b) Target Date : 010214(14th. Feb. 2001) c) SET Key(3second Pressing) > F01-00 > 9 of key > 5 of key > CLR d) 01 of key > 02 of key > 1 of key > 4 of key > SET.
<p>※ DATE and TIME can be ran by printer(OP-07) option only.</p> <p>※ 20 of 2001year can not input by 20.</p>	

TIME Amend.	
F96	<p>How to amend</p> <ul style="list-style-type: none"> a) CLR Key after input 96 in order to go to F96 in SET UP Mode. b) SET after input your target Time. <p>For example.</p> <ul style="list-style-type: none"> a) Current Date : 172530(30sec / 25min / 17hr) b) Target Date : 215556(56sec / 55min / 21hr) c) SET Key(3second Pressing) > F01-00 > 9 of key > 6 of key > CLR d) 2 of key > 1 of key > 5 of key > 5 of key > 5 of key > 6 of key > SET.
<p>※ DATE and TIME can be ran by printer(OP-07) option only.</p> <p>※ TIME do input/output by 24hr. rule..</p>	

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

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	⓪	7 data + EVEN Parity
	1	7 data + ODD Parity
	2	8 data + NO Parity
	3	8 data + EVEN Parity
	4	8 data + EVEN Parity

Transmit Mode		
F32	⓪	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)
※ F32-3 Measure Finish ? a) Manual Mode : Data output when pressing the print key. b) Auto Mode : Data output when the function of F24 run. ※ The conversion of Manual / Auto can be changed by "Auto" of keypad(F19 Refer)		

Transmit Data Format		
F33	⓪	ST(Header1) , NT(Header2), Weight(8), kg(Unit) CR LF
	1	ST(Header1) , NT(Header2), Weight(8), kg(Unit), Time(6), CR LF
	2	
	3	
	4	
	5	

STX Attach For Transmit Data		
F34	⓪	NO attach
	1	First character will be transmitted by 'STX'(ASCII = 02)

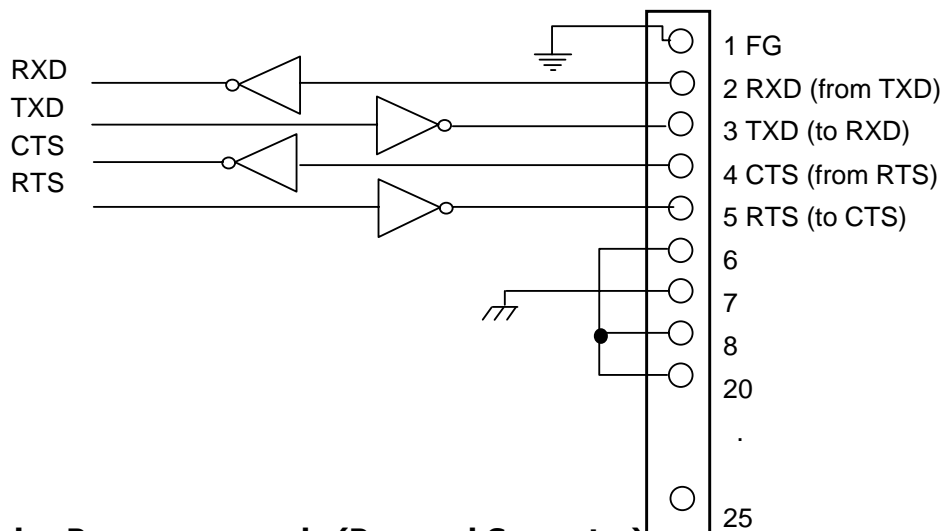
Interface wire control for RS422(485)		
F35	⓪	NO Available for CS, RS In case of RS 422, 485
	1	Available for CS, RS.

Select Interface Weight		
F36	⓪	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 COMMA “,”		
F37-	⓪	NO USE “,” AFTER ID
	1	“,” AFTER ID
		This function can use if ID is setting with F90.

- ▶ 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
 - k : Unit of Kg
 - t : Unit of TON
 - l b : Unit of Pound

☒ **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 4800 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

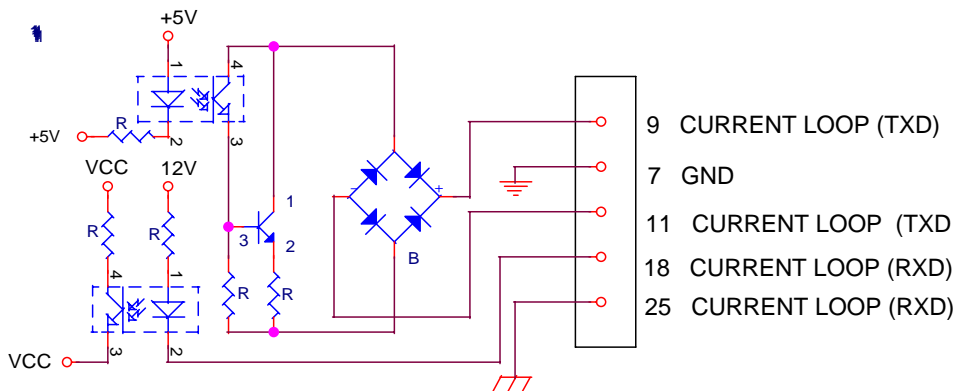
Same as 5-1 RS-232 Interface.

☒ 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.

FS-2101C COMMAND MODE INTERFACE FORMAT

COMMAND	FUNCTION	RESPONSE	
		COMMAND MODE (F32-04)	Transmit Mode
R CR LF	Request a current weight	Standard DATA FORMAT	No receive
T CR LF	Same with [TARE] Key	ACK CR LF	NO
KT weight(6) CR LF	Same with [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 with [ZERO] Key	ACK CR LF	NO
P CR LF	Same with [PRINT] Key	ACK CR LF	NO
ST CR LF	Same with [Sub-total] Key	ACK CR LF	NO
GT CR LF	Same with [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
PN (2) CR LF	Convert to display "Part"	ACK CR LF	NO
PS (6) CR LF	Target Weight Setting	ACK CR LF	NO
DB (4) CR LF	Drib Setting.	ACK CR LF	NO
FA (4) CR LF	Fall Setting.	ACK CR LF	NO
BU (6) CR LF	Bulk Setting.	ACK CR LF	NO
RPS CR LF	Request " Target Weight"	ACK CR LF	No receive
RDB CR LF	Request " Drib"	ACK CR LF	No receive
RFA CR LF	Request " Fall"	ACK CR LF	No receive
OP CR LF	START Signal Setting.	ACK CR LF	NO
EM CR LF	STOP Signal Setting.	ACK CR LF	NO
CD (6) CR LF	CODE 6 Digits SETTING	ACK CR LF	NO
DT YYYYMMDD CR LF	DATE SETTING	ACK CR LF	NO
TI HHMMSS CR LF	TIME SETTING	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 DATA	PART(2), Times(6), Weight(11) CR LF	No receive
RGT CR LF	REQUEST TOTAL DATA	Times(8) , Weight (13) CR LF	No receive
REN CR LF	REQUEST FINAL WEIGHT	Weight(7) CR LF	No receive

- F90- (01-99) SETTING : If you try to set F90 then A Equipment ID NO("ID(2)") must be added to The head of All command also the head of RESPONSE will be transmitted with ID NO(2Digit) and " , "
- The Start of Transmit/Receive will be done by STX (ASCII=02) in case of F34-01.
- Do not set the decimal point in weight data received from
- It was included with the decimal point in the weight data which is being transmitted.
- If it was received normally then ACK CR LF will transmit.
Otherwise, No answer or NAK CR LF will transmit
- Another Command except of " No Receiving " will be available to an external equipment
Without Command mode setting.

5-4. SETTING FOR SIGNAL CONTROL WAY

F40	Ⓞ	Simple Comparison 3step Control 1(Limit Mode)
	1	Simple Comparison 3step Control 2
	2	Sequence 3step Control 1(Packer Mode)
	3	Sequence 3step Control 2
	4	Discharge 2step, Input 1step Control 1(Discharging Mode
	5	Discharge 2step, Input 1step Control 2
	6	Discharge 2step, Input 1step Control 3
	7	Discharge 2step, Input 1step Control 4
	8	Simple Comparison 3step, Control 3(High ,Low Relay Run

SIMPLE COMPARISON 3 STEP CONTROL :

It is the control system which 1st, 2nd, 3rd Relay continuously run according to the weight difference. If the actual weight will be same or bigger than target weight the relay will be ON, If it was under than them then it will be OFF.

Also if 3rd Relay run then a finish relay will run according to F46 Setting.

Even If a current weight was even under 3step it will be available but if it was under 2step then a finish relay does not work.

The weight range will input (+ range) according to F45, then 1,2,3rd Relay will run from Discharge(-range) or absolute range.

SEQUENCE 3STEP CONTROL

1,2,3rd Relay will run(ON) by Start Key and will no run(OFF) if the weight was same or bigger than the target weight.

After 3rd Relay will OFF then Finish Relay will run according to F46, OFF Relay do not run even if the weight was lower than the target weight.

STOP Input will be used on abnormal only but will not do on normal time.

DISCHARGE 2STEP, INPUT 1STEP CONTROL

It was for Discharge Control Mode only and configured with INPUT 1Step control and Discharge 2Step Control.

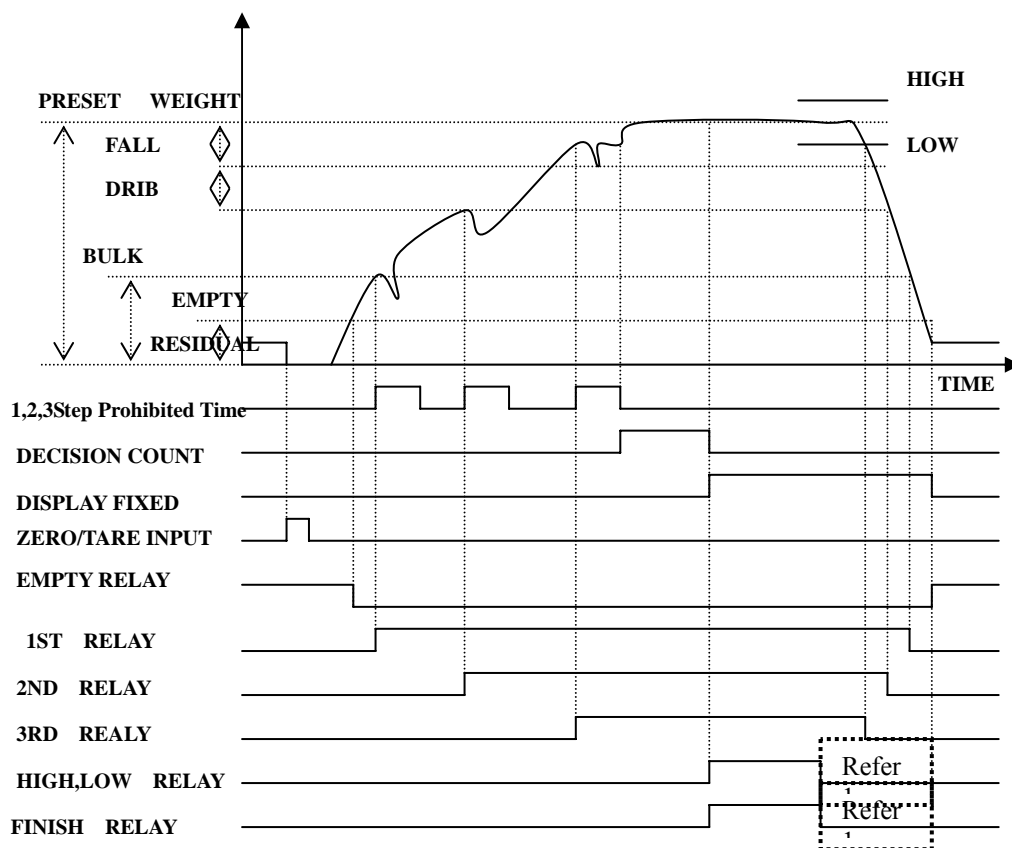
A current weight will be TARE by START then the display will be ZERO and Discharge weight will be displayed by "-".

If a current weight was lower than 110% of target weight then START don`t use and INPUT Relay will run and the display automatically converted to Gross weight.

SIMPLE COMPARISON 3STEP CONTROL 1(LIMIT MODE)

F40-00

FINISH REALY AND HIGH LOW RELAY



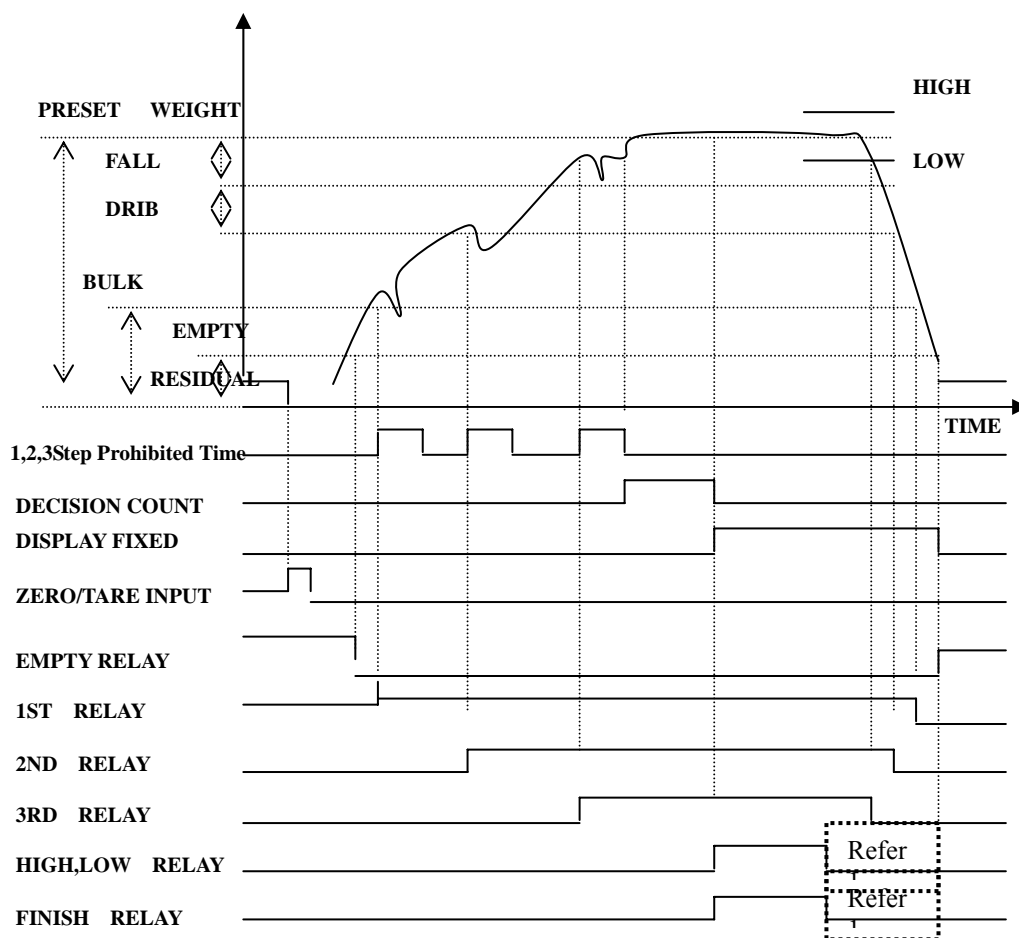
- The basic Run is same with simple Comparison 3step control 2
But, High and Low Relay run at the same time then finish relay run.
- It is the control system which 1st, 2nd, 3rd Relay continuously run according to the weight difference If the actual weight will be same or bigger than target weight the relay will be ON, If it was under than them then it will be OFF.
Also if 3rd Relay run then a finish relay will run according to F46 Setting.
Even If a current weight was even under 3step it will be available but if it was under 2step then a finish relay do not run.
- The weight range will input (+ range) according to F45,then 1,2,3nd Relay will run from Discharge(-range) or absolute range
- The FALL compensation run according to **F43 setting**.
- Refer1) If **F42-00 setting** then Finish, High, Low relay will keep.

OUT1 : 1st ^t		OUT2 : 2nd		OUT3 : 3rd		OUT4 : Finish		OUT5 : High, Low		OUT6 : Empty	
F40	0					F44	Prohibited Time Setting				
F41	Decision Count Time Set after 3 rd relay					F45	Weight Range Setting(Input, Discharge)				
F42	Finish, High, Low relay Run time Setting					F46	Finish Standard(Manual, Time, Steady)				
F43	Fall compensation Function Setting					F47	Hold Function when Finish relay				
						F48	No Available.				

SIMPLE COMPARISON 3STEP CONTROL 2(LIMIT MODE)

F40-01

HIGH LOW RELAY(FINISH RELAY NO AVAILABLE)



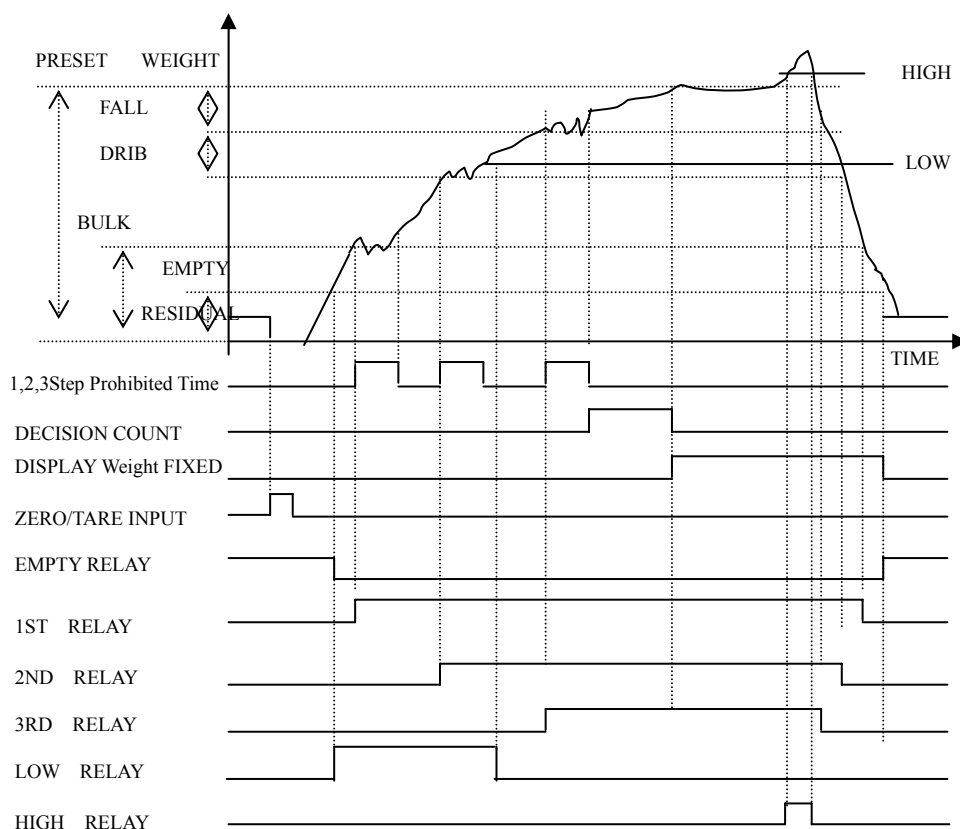
- The basic Run is same **as simple 3step control 1**
But, High and Low Relay run at the same time without Finish Relay
- It is the control system which 1st, 2nd, 3rd Relay continuously run according to the weight
If the actual weight will be same or bigger than target weight the relay will be ON, If it was under than them then it will be OFF.
Also if 3rd Relay run then a finish relay will run according to F46 Setting.
Even If a current weight was even under 3step it will be available but if it was under 2step then a finish relay don't run.
- The weight range will input (+ range) according to F45, then 1,2,3rd Relay will run from Discharge(-range) or absolute range
- The FALL compensation run according to **F43 setting**.
- Refer1) If **F42-00 setting** then Finish, High, Low relay will keep.

OUT1 : 1st ^t	OUT2 : 2nd	OUT3 : 3rd	OUT4 : Finish	OUT5 : High, Low	OUT6 : Empty
F40	0		F44	Prohibited Time Setting	
F41	Decision Count Time Set after 3 rd relay		F45	Weight Range Setting(Input, Discharge)	
F42	Finish, High, Low relay Run time Setting		F46	Finish Standard(Manual, Time, Steady)	
F43	Fall compensation Function Setting		F47	Hold Function when Finish relay	
			F48	No Available.	

SIMPLE COMPARISON 3STEP CONTROL 3(LIMIT MODE)

F40-08

HIGH, LOW CONTINUOUS RELAY



- The basic Run is same **as simple 3step control 2**
But, High and Low Relay depends on the difference between Preset and actual weight.
- It is the control system which 1st, 2nd, 3rd Relay continuously run according to the weight
If the actual weight will be same or bigger than target weight the relay will be ON, If it was under than them then it will be OFF.
Also if 3rd Relay run then a finish relay will run according to F46 Setting.
Even If a current weight was even under 3step it will be available but if it was under 2step then a finish relay don't run.
- The weight range will input (+ range) according to F45, then 1,2,3rd Relay will run from Discharge(-range) or absolute range
- The FALL compensation run according to **F43 setting**.

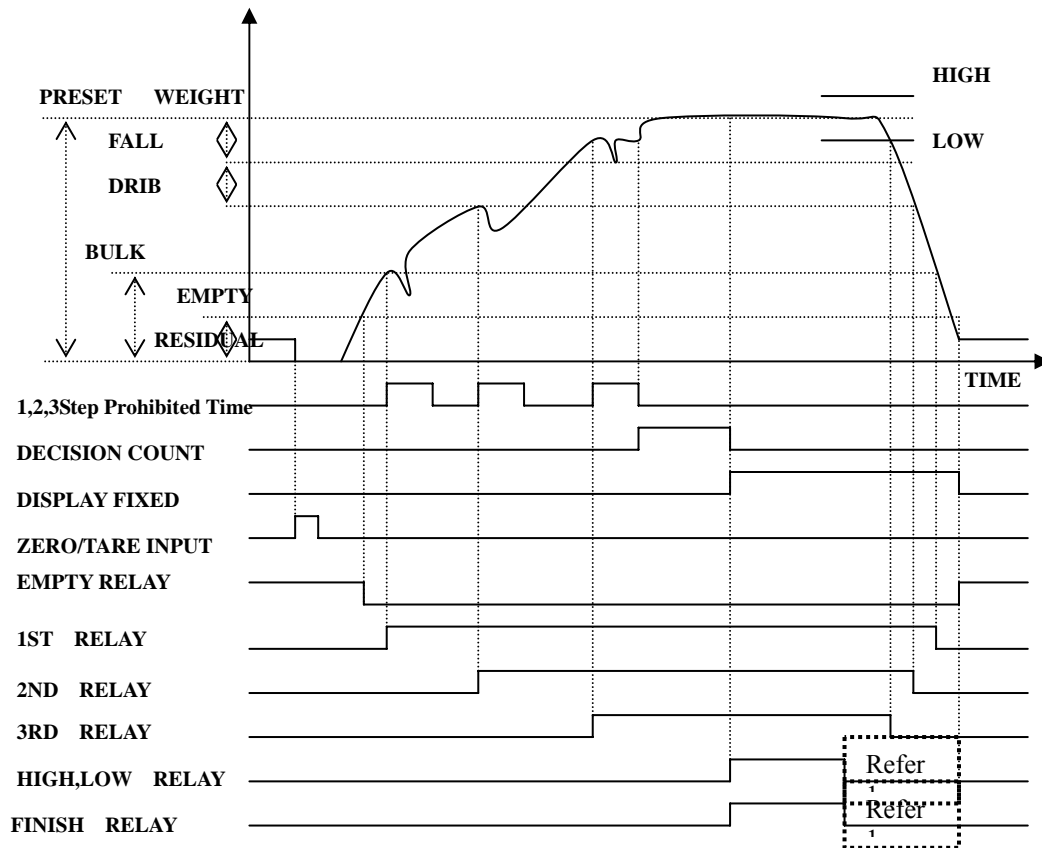
OUT1 : 1st ^t	OUT2 : 2nd	OUT3 : 3rd	OUT4 : Low	OUT5 : High	OUT6 : Empty
F40	8		F44	Prohibited Time Setting	
F41	Decision Count Time Set after 3 rd relay		F45	Weight Range Setting(Feed, Discharge)	
F42	Not Available		F46	Finish Standard(Manual, Time, Steady)	
F43	Fall compensation Function Setting		F47	Hold Function when Finish relay	
			F48	No Available.	

- In case of using 3th Relay, the bulk setting was "0" then 1st Relay will work and if the target and Drib setting was the same value then 2nd Relay will work Finally 3th Relay Only can be worked
By the adjustment of Fall value(In Limit Mode Only)

SEQUENCE COMPARISON 3STEP CONTROL 1(PACKER MODE)

F40-02

FINISH RELAY AND HIGH LOW RELAY



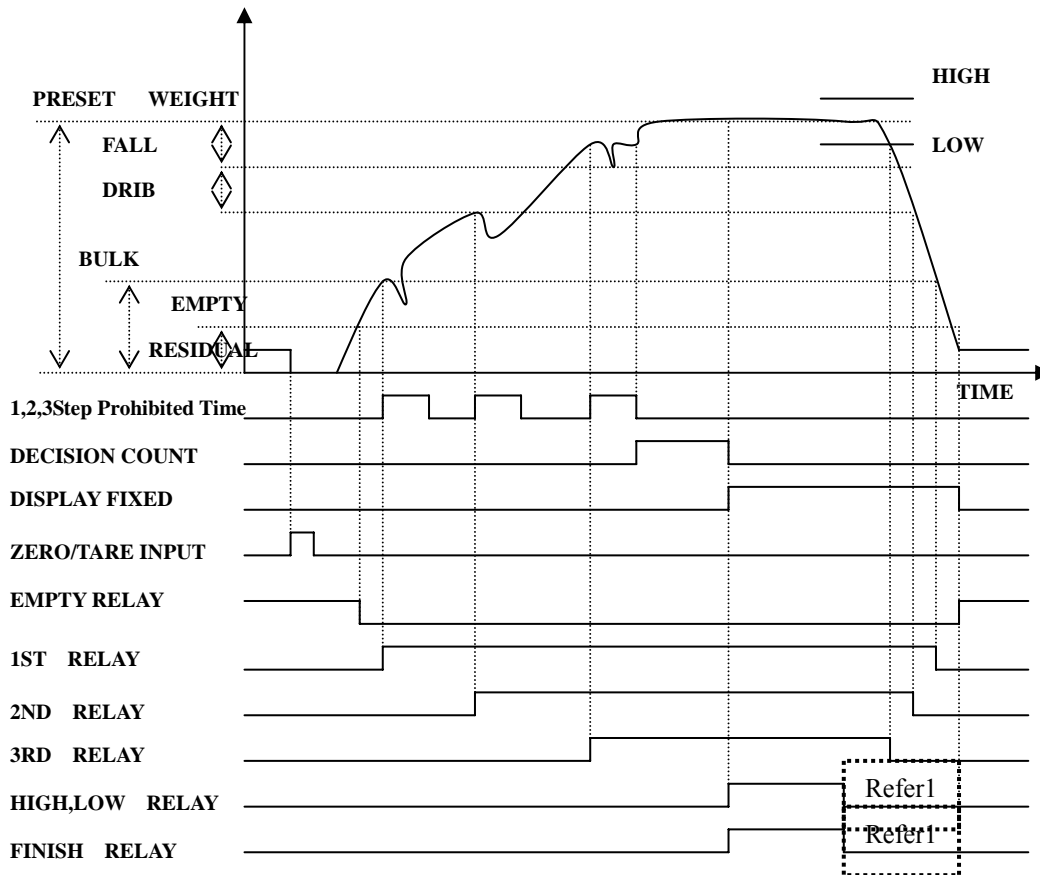
- The basic Run is same **as simple 3step control 2**
But, High and Low Relay run at the same time then finish relay run.
- It is the control system which 1st, 2nd, 3rd Relay continuously run according to the weight
If the actual weight will be same or bigger than target weight the relay will be ON, If it was under than them then it will be OFF.
Also if 3rd Relay was OFF then a finish relay will run depending on F46 Setting.
- ZERO or TARE setting can be done by START key(F48 Refer)
- The weight range will input (+ range) according to F45, then 1,2,3nd Relay will run from Discharge(-range) or absolute range
- The FALL compensation run according to **F43 setting**.
- Refer1) If **F42-00 setting** then Finish, High, Low relay will keep.

OUT1 : 1st	OUT2 : 2nd	OUT3 : 3rd	OUT4 : Finish	OUT5 : High, Low	OUT6 : Empty
F40	2		F44	Prohibited Time Setting	
F41	Decision Count Time Set after 3 rd relay		F45	Weight Range Setting(Input, Discharge)	
F42	Finish, High, Low relay Run time Setting		F46	Finish Standard(Manual, Time, Steady)	
F43	Fall compensation Function Setting		F47	Hold Function when Finish relay	
			F48	ZERO or TARE setting by START Key	

SEQUENCE COMPARISON 3STEP CONTROL 2(PACKER MODE)

F40-03

HIGH RELAY AND LOW RELAY



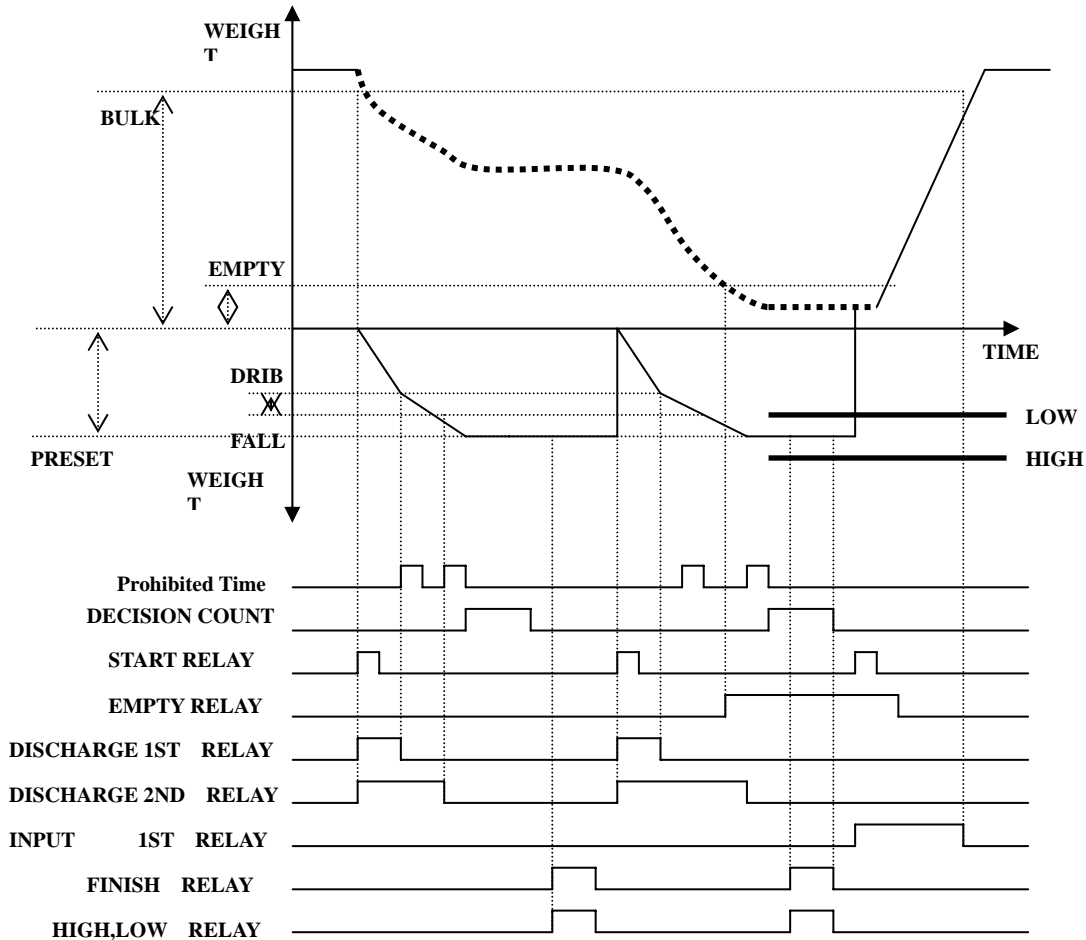
- The basic Run is same **as simple 3step control 1**
But, High and Low Relay run at the same time then finish relay run.
- It is the control system which 1st, 2nd, 3rd Relay continuously run according to the weight
If the actual weight will be same or bigger than target weight the relay will be ON, If it was under than them then it will be OFF.
Also if 3rd Relay was OFF then a finish relay will run depending on F46 Setting.
- ZERO or TARE setting can be done by START key(F48 Refer)
- The weight range will input (+ range) according to F45, then 1,2,3nd Relay will run from Discharge(-range) or absolute range
- The FALL compensation run according to **F43 setting**.
- Refer1) If **F42-00 setting** then Finish, High, Low relay will keep.

OUT1 : 1st	OUT2 : 2nd	OUT3 : 3rd	OUT4 : Low	OUT5 : High	OUT6 : Empty
F40	3		F44	Prohibited Time Setting	
F41	Decision Count Time Set after 3 rd relay		F45	Weight Range Setting(Input, Discharge)	
F42	High, Low relay Run time Setting		F46	Finish Standard(Manual, Time, Steady)	
F43	Fall compensation Function Setting		F47	Hold Function when Finish relay	
			F48	ZERO or TARE setting by START Key	

DISCHARGE 2STEP,FEED 1STEP CONTROL 1(DISCHARGE MODE)

F40-04

FINISH RELAY AND HIGH RELAY AND LOW RELAY



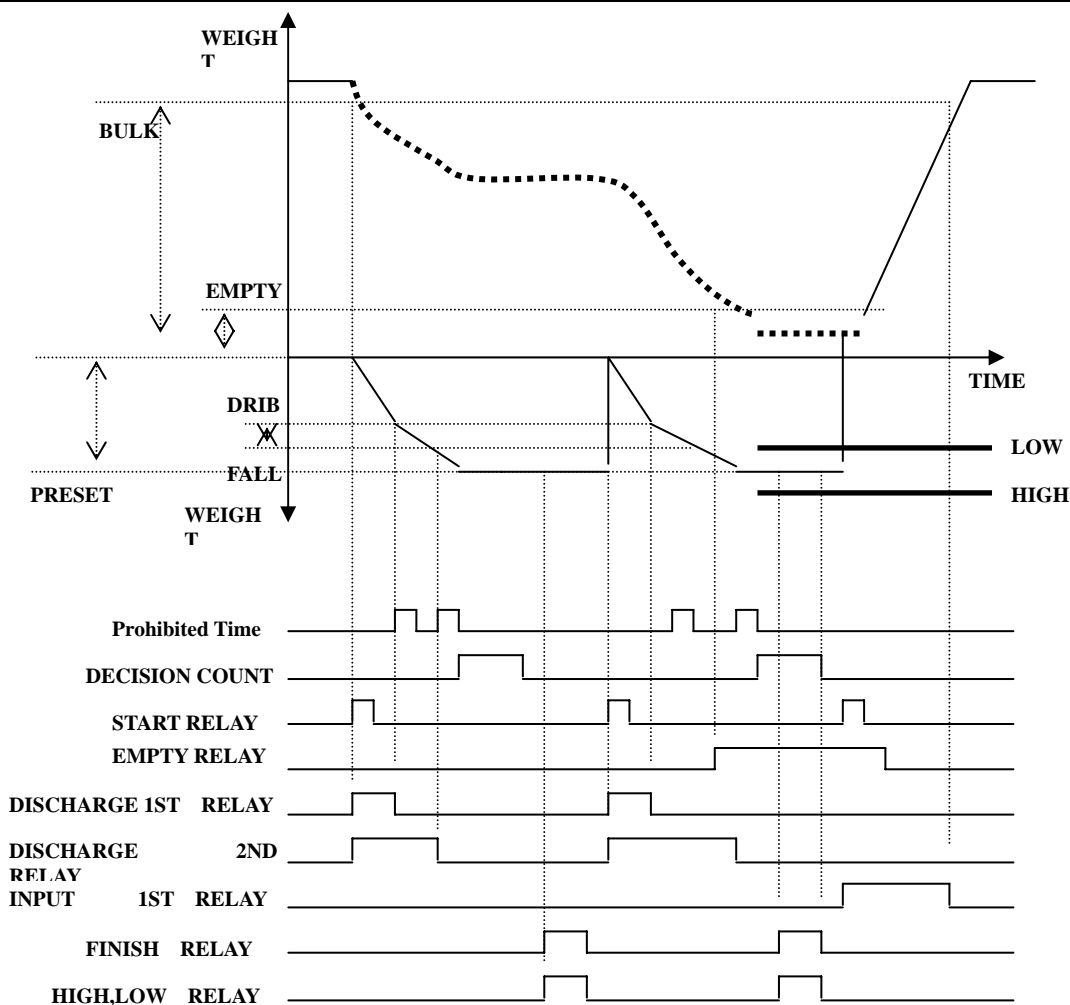
- This MODE was DISCHARGE MODE and **Discharge 2Step and Feed 1Step Control**
Bulk Relay can be controlled by Preset, Drib, Fall and Discharge 2Step for Controlling Feeding volume. The working Conditions by START Relay.
 - Gross Weight must be over rather than 110% of Preset.
 - Gross Weight must be bigger than Empty.
 If No the above conditions then Input 3Step Relay run by START Relay.
Also the display converted to Gross and keep it until the BULK then Discharge 1st,2nd Relay don't run.
- Automatically TARE will be set up by START and the display show "0" and 1,2 relay will be ON by START Relay and will be OFF if the weight will be same or over than Preset.
- It was same with F40-5 and has FINISH Relay and will run at the same with HIGH,LOW.

OUT1 : 1st	OUT2 : 2nd	OUT3 : Feed	OUT4 : Finish	OUT5 : High, Low	OUT6 : Empty
F40	4		F45	Display weight 0=NET,1=GROSS	
F41	Decision Count Time Set after 2nd relay		F46	Finish Standard(Manual, Time, Steady)	
F42	Finish, High, Low relay Run time Setting		F47	NO Available	
F43	Fall compensation Function Setting		F48	TARE setting Fixed by START.	
F44	Prohibited Time setting		F49	Setting for Feeding LOW	

DISCHARGE 2STEP,FEED 1STEP CONTROL 2(DISCHARGE MODE)

F40-05

HIGH RELAY AND LOW RELAY



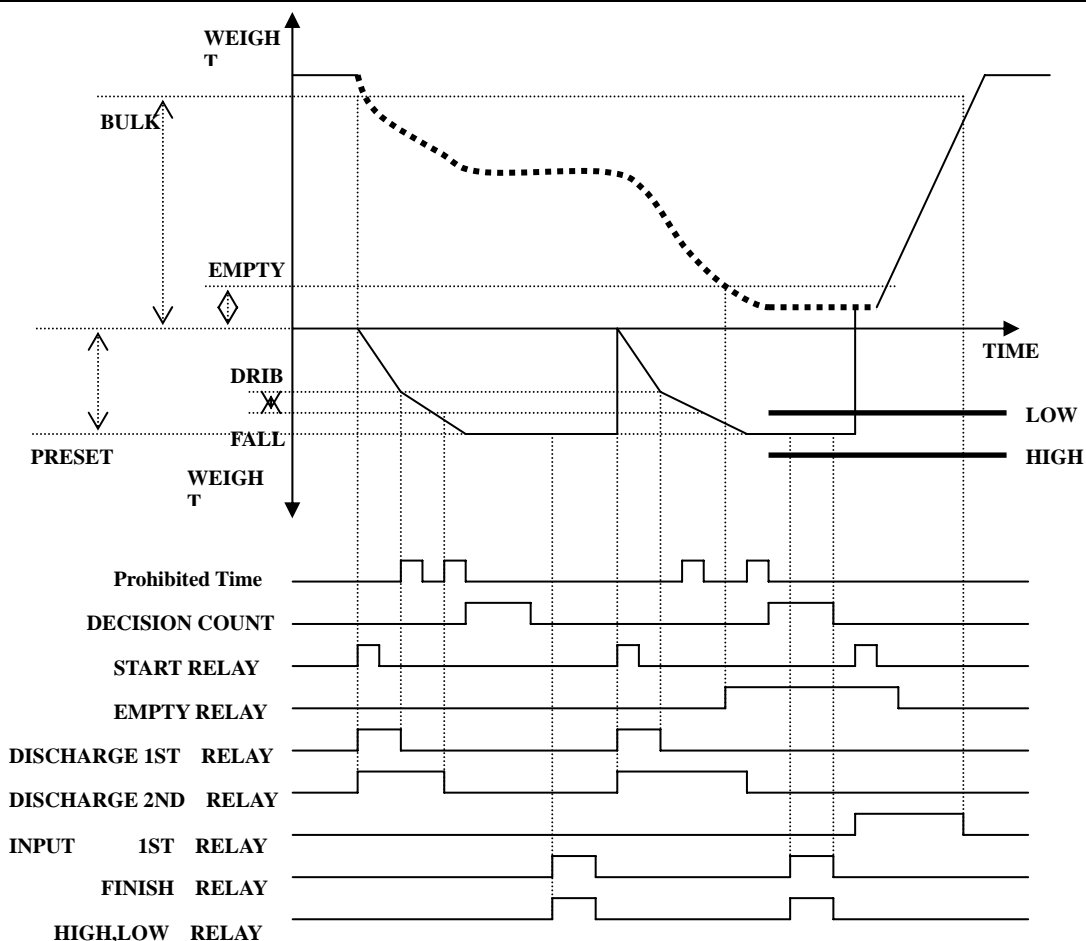
- This MODE was DISCHARGE MODE and **Discharge 2Step and Feed 1Step Control**
Bulk Relay can be controlled by Preset, Drib, Fall and Discharge 2Step for Controlling Feeding volume. The working Conditions by START Relay.
 - Gross Weight must be over rather than 110% of Preset.
 - Gross Weight must be bigger than Empty.
 If No the above conditions then Input 3Step Relay run by START Relay.
Also the display converted to Gross and keep it until the BULK then Discharge 1st,2nd Relay don't run.
- Automatically TARE will be set up by START and the display show "0" and 1,2 relay will be ON by START Relay and will be OFF if the weight will be same or over than Preset.
- It was same with F40-4 and has FINISH Relay and will run at the same with HIGH,LOW.

OUT1 : 1st	OUT2 : 2nd	OUT3 : Feed	OUT4 : LOW	OUT5 : HIGH	OUT6 : Empty
F40	5		F45	Display weight 0=NET,1=GROSS	
F41	Decision Count Time Set after 2nd relay		F46	Finish Standard(Manual, Time, Steady)	
F42	Finish, High, Low relay Run time Setting		F47	NO Available	
F43	Fall compensation Function Setting		F48	TARE setting Fixed by START.	
F44	Prohibited Time setting		F49	Setting for Feed LOW	

DISCHARGE 2STEP,FEED 1STEP CONTROL 3(DISCHARGE MODE)

F40-06

FINISH RELAY AND HIGH RELAY AND LOW RELAY



■ This MODE was DISCHARGE MODE and **Discharge 2Step and Feed 1Step Control**

Bulk Relay can be controlled by Preset, Drib, Fall and Discharge 2Step for Controlling Feed volume. The working Conditions by START Relay.

- Gross Weight must be over rather than 110% of Preset.
- Gross Weight must be bigger than Empty.

If No the above conditions then Input 3Step Relay run by START Relay.

Also the display converted to Gross and keep it until the BULK then Discharge 1st,2nd Relay don't run.

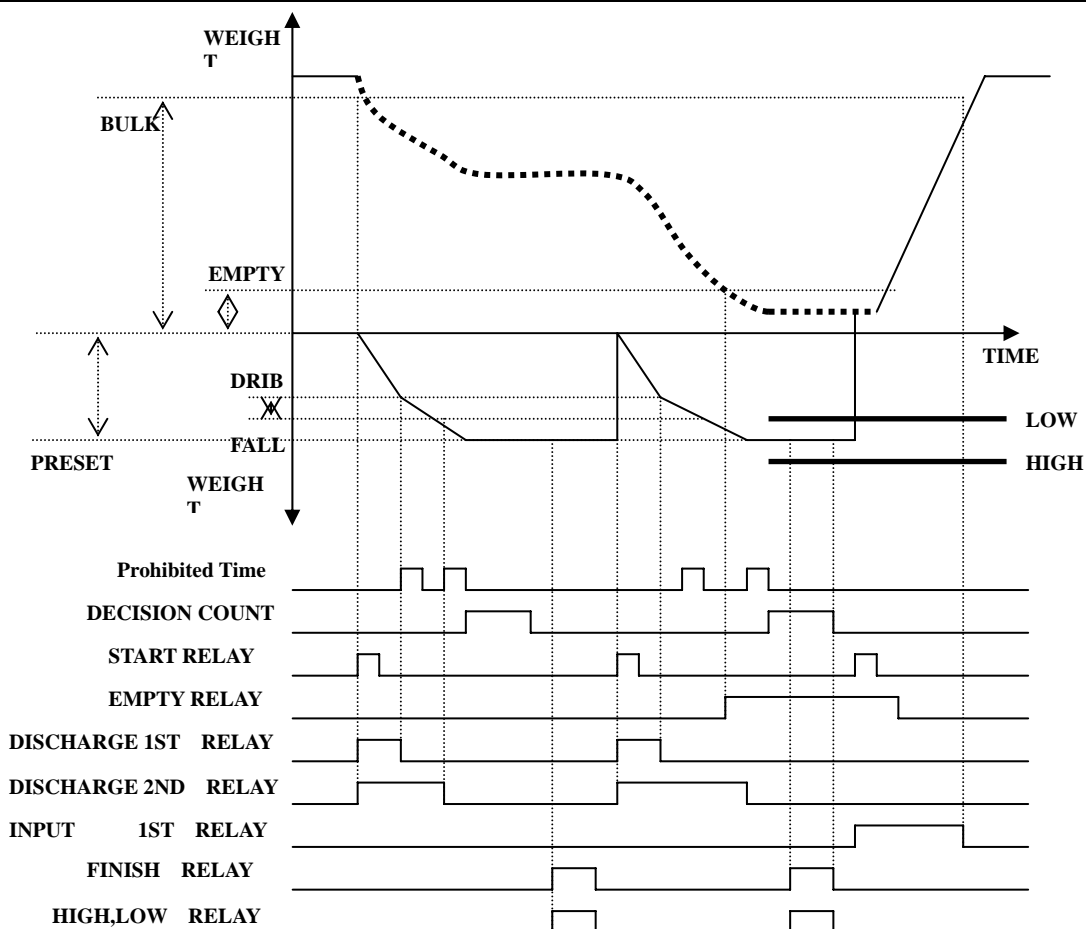
- Automatically TARE will be set up by START and the display show "0" and 1,2 relay will be ON by START Relay and will be OFF if the weight will be same or over than Preset.
- It was same with F40-7 and has FINISH Relay and will run at the same with HIGH,LOW.

OUT1 : 1st	OUT2 : 2nd	OUT3 : Feed	OUT4 : FINISH	OUT5 : HIGH,LOW	OUT6 : Empty
F40	6		F45	Display weight 0=NET,1=GROSS	
F41	Decision Count Time Set after 2nd relay		F46	Finish Standard(Manual, Time, Steady)	
F42	Finish, High ,Low relay Run time Setting		F47	NO Available	
F43	Fall compensation Function Setting		F48	TARE setting Fixed by START.	
F44	Prohibited Time setting		F49	Setting for Feed LOW	

DISCHARGE 2STEP, FEED 1STEP CONTROL 4(DISCHARGE MODE)

F40-07

FINISH RELAY AND HIGH RELAY AND LOW RELAY



■ This MODE was DISCHARGE MODE and **Discharge 2Step and Feed 1Step Control**

Bulk Relay can be controlled by Preset, Drib, Fall and Discharge 2Step for Controlling Feed volume. The working Conditions by START Relay.

- Gross Weight must be over rather than 110% of Preset.
- Gross Weight must be bigger than Empty.

If No the above conditions then Input 3Step Relay run by START Relay.

Also the display converted to Gross and keep it until the BULK then Discharge 1st, 2nd Relay don't run.

- Automatically TARE will be set up by START and the display show "0" and 1,2 relay will be ON by START Relay and will be OFF if the weight will be same or over than Preset.
- It was same with F40-6 and has FINISH Relay and will run at the same with HIGH,LOW.

OUT1 : 1st	OUT2 : 2nd	OUT3 : Feed	OUT4 : LOW	OUT5 : HIGH	OUT6 : Empty
F40	7		F45	Display weight 0=NET,1=GROSS	
F41	Decision Count Time Set after 2nd relay		F46	Finish Standard(Manual, Time, Steady)	
F42	Finish, High Low relay Run time Setting		F47	NO Available	
F43	Fall compensation Function Setting		F48	TARE setting Fixed by START.	
F44	Prohibited Time setting		F49	Setting for Feed LOW	

- 1) 1st,2nd,3rd Prohibited Time
If the actual weight have some problems by the vibrations according to 1st,2nd,3rd Supply Device,
Then it can control Time enough to make accurate weight by F44 Time setting.
- 2) Decision Count Range.
It was the Range which weigh a final weight after a final prohibited time.
 - a) Manual Count : F46-00 Total Weight by Print Key.
 - b) Steady : F46-01 Total Weight In case of Not movable weight.
 - c) Steady and Time : If it was not enough for F46-01 Time then F46-02 Total Weight after F41.
 - d) Time : F46-03 Total weight after Time setting by F41.
- 3) Display Fixed Range :
It can make a final weight fixed after finishing a weight.
F47-01 : It display the fixed weight until the Empty relay.
: It display the weight without a fixed function.
But, it will not be available to the Discharge Mode.
- 4) ZERO/TARE
It can make weight ZERO before start to weigh.
ZERO Input : For a normal Type and ZERO Range : F07 Refer.
TARE Input : For accumulated Type
It can set the previous weight into TARE setting.
It can set a current weight into ZERO.
And after a final working then it can check a accumulated weight by Gross weight.
But, it do not need to input it in case of the discharge Mode.
It can set AUTO TARE when STARE Relay.
- 5) EMPTY Relay.
It run Empty Relay when the weighing on weighing part will be under a fixed weight
F13 : EMPTY MODE Setting. ;
F14 : It can set EMPTY size in case of F13-02,F13-03
F15 : It can refer the weight comparison(Display weight, Basic Weight)
It can recommend F15-01(Basic ZERO) in case of a accumulated weight.
- 6) Control Relay 1 : It can run by BULK Relay.
- 7) Control Relay 2 : It will ON when PRESET-(DRIB+FALL) will be same or over.
And will be OFF when it will be under. It will ON when
- 8) Control Relay 3 : It will ON when PRESET-(FALL) will be same or over.
And will be OFF when it will be under.
- 9) Finish Relay : It will be ON when finishing and OFF after setting F42.
- 10) Start Relay : It will start to weigh by Sequence Control.
It will be at the same with TARE Setting in case of Discharge Mode.

Delay time Setting of FINISH and HIGH,LOW Relay.		
F-41	0	It can set TIME until a FINISH Decision after 3step relay. The discharge will be set TIME until FINISH Decision by discharge 2Step Relay. It can set per 0.1sec. *First Setting : 10(1sec)
	99	

Run time Setting of FINISH and HIGH,LOW Relay.		
F-42	0	RUN time setting of FINISH Decision Relay. It can set per 0.1sec In case of "00" setting, It will keep it until EMPTY and START Relay *First Setting : "00"(Continuous)
	99	

Function SETTING For FALL COMPANSTION		
F-43	0	NO FALL COMPENSATION
	1	80% FALL COMPENSATION WITH 5Times
	2	90% FALL COMPENSATION WITH 10Tmes
	3	90% FALL COMPENSATION WITH 20Times
	4	100% FALL COMPENSATION WITH 50Times
Fall Compensation will not be available if setting weight was over +/- 10% range		

Setting for Weight Decision Prohibited Time		
F-44	0	Weight will not be done for some time after 1 st ,2 nd Relay. It can protect weight Error by Gate running. *First Setting : "03"(0.3 sec)
	99	

SETTING For A Weighing Range		
F-45	0	It run the control relay in the range of "+" weight only
	1	It run the control relay in absolute weight.
	2	It run the control relay in the range of "-" weight only
	For DISCHARGE CONTROL	
	0	It run in case of NET Weight display.
	1	It run in case of GROSS Weight display.
	2	It convert automatically to GROSS display after F42 Time setting by NET Display. It convert automatically after 3second in case of F42 "00"setting.

SETTING For Finish System		
F-46	0	Use for histogram chart by PINTER Key or Manual work
	1	Finish Relay worked by Steady Relay after 2 nd Relay (Useless for the setting of F41)
	2	Finish Relay worked by Steady Relay after 2 nd Relay OR the time of F41 (Finish Relay work when steady relay work in the setting TIME)
	3	Finish Relay worked by F41 after 2 nd Relay

SETTING For Weight Display system		
F-47	0	A continuous display for weight variations
	1	It display a weight until Finish Relay will be converted to Empty or Start Relay

SETTING ZERO,TARE when START run.		
F-48	0	NO FUNCTION
	1	ZERO Setting. But, START will not be available in case it will not in the range of F07 Setting
	2	TARE Setting.
But, it will not be available in case of Discharge Mode.		

Weight Setting for INPUT LOW standard.

F-49	When a current weight was below the preset weight in Discharge Mode, Then it will be INPUT Relay. In case of "0" setting then if it was below 110% of the discharge weight, Then Input Relay will run. First Setting : 000000
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5-5. ADDITIONAL SET UP FUNCTION

5-5-1 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, display, record as connected with PLC(Programmed Logic Control).

* 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-	⊙	Displayed Weight Value
	1	GROSS Weight
	2	NET Weight

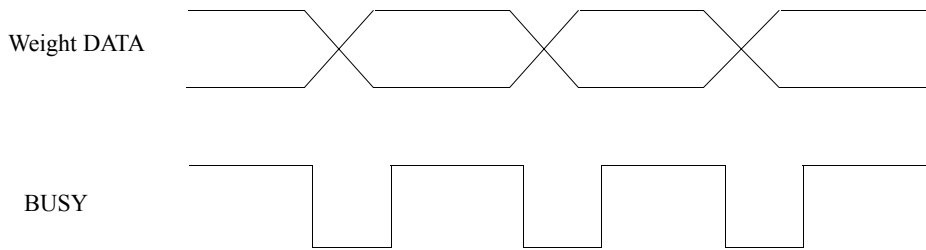
BCD OUTPUT POLARITY		
F51-	⊙	Positive Logic
	1	Negative Logic

☒ Connected Pin Diagram

PIN NO	SIGNAL
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

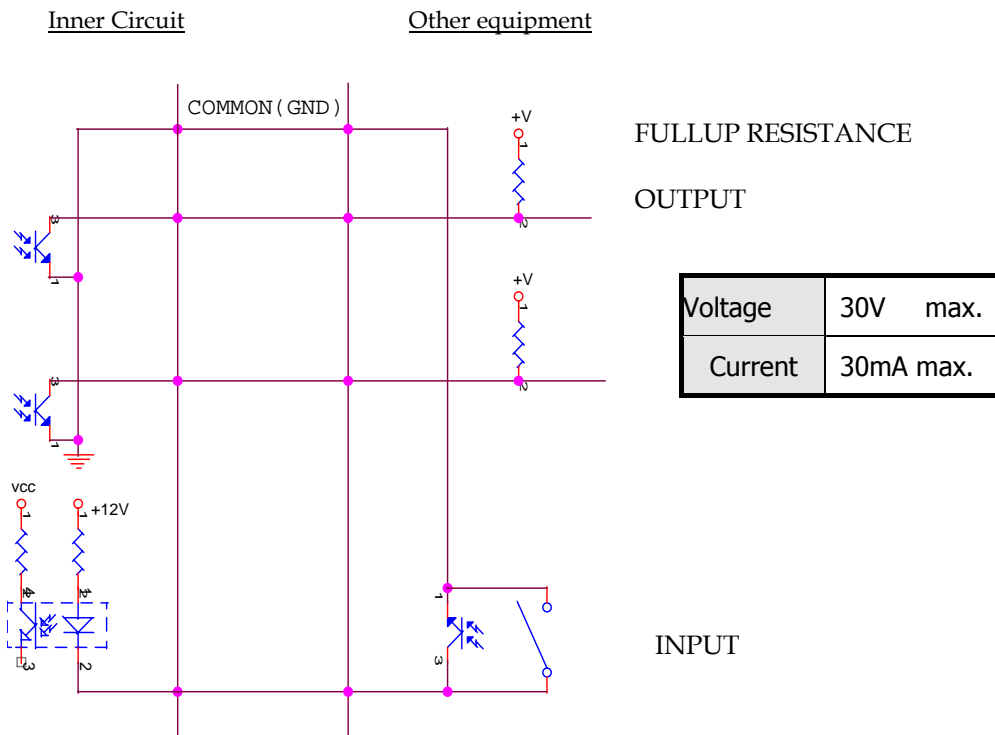
PIN NO	SIGNAL
26	Hi : Net LOW : Gross
27	
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	EX. Vcc
38	
39	EX. Vcc
40	
41	
42	Hi : Positive Polarity
43	Decimal Point 10^1
44	" 10^2
45	" 10^3
46	
47	OVER LOAD
48	
49	BUSY
50	HOLD (INPUT)

- ▶ 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 OUTPUT CIRCUIT**



- ▶ OUTPUT CIRCUIT IS OPEN COLLECTOR TYPE
- ▶ If output demand TTL LEVEL ,insert full up - resistance to a board of BCD OPTION
- ▶ When inserting a full up resistance ,please change 5v ~ 30V in **37,39 NO** Resistance and Voltage .
5V = 1 kΩ , 10V = 2 kΩ , 15V = 2.7kΩ , 24V = 5 kΩ

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

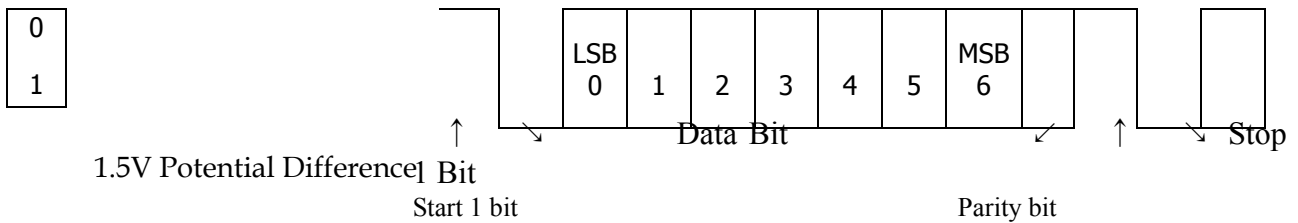
- RS-422/485 is to transmit signal by voltage deviation and more stable than others.
- RS-485 should be connected as follows.

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**

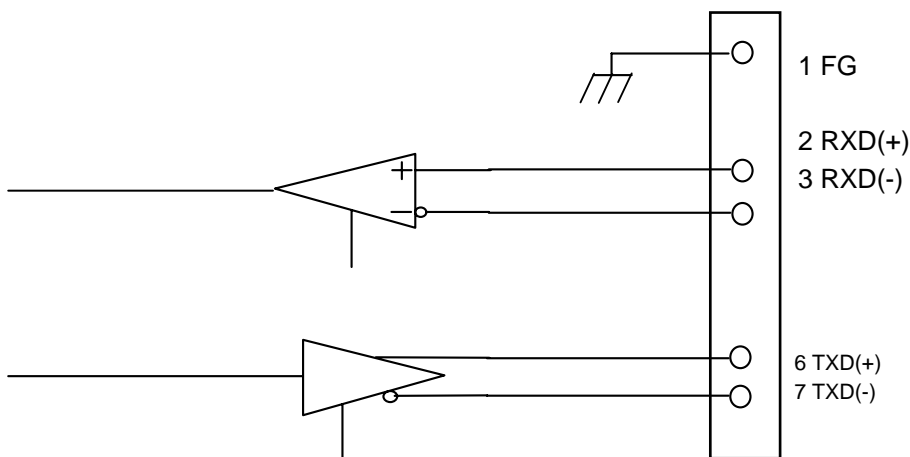
- ① TYPE : RS-422/485
- ② FORMAT :
 - Ⓐ Baud-Rate : 300 ~ 38.4k . Selection
 - Ⓑ Data Bit : 7 or 8 (NO Parity)
 - Ⓒ Stop : 1
 - Ⓓ Parity Bit : Even, Odd, NO Parity Selection
 - Ⓔ Code : ASCII



☒ **DATA FORMAT**

- It is the Same with RS - 232C

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



5-5-3 OPTION-05/06 ANALOG OUT

- This option is a device to output and convert the weight value to External device(Recorder P.L.C Center control so) controlled by Analog Signal.
- The voltage output occurs the voltage according to the size of weight in 0V ~10V.
- The current output occurs the current according to the size of weight in 4mA~20Ma
- The precision of Analog output is Max.1/3000
- It will not be suitable for a high precision over 1/3000

Select Weight for Analog Out		
F60-	⓪	Displayed Weight value
	1	GROSS Weight
	2	NET Weight
Gross or Net Weight can be different with weight value displayed		

Select Analog Out Standard		
F61-	⓪	Max. Weight Standard
	1	Standard value setup by F-63

Select Analog Out Polarity		
F62-	⓪	Positive out : 4mA, 0V while weight is 0
	1	Negative out : 20mA, 5V, 10V while weight is 0

SET Standard Weight For Analog Out	
F63-	Analog max out value when weight setup. * first Setting 000000

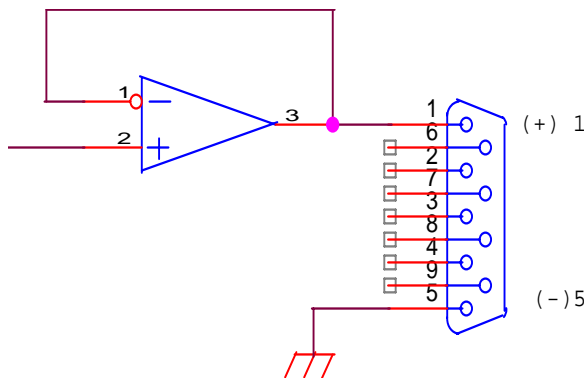
5-5-3V OP-05 voltage (0 ~ 10V) ANALOG OUT

- 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 kΩ

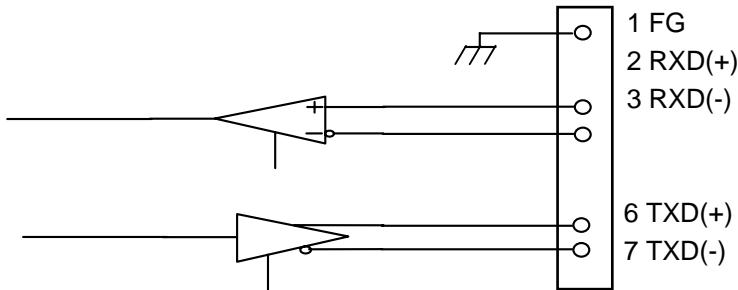
☒ Connector Pin Diagram(9P D-TYPE Female)& Voltage out circuit



※ 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 0V and was Max. Weight then 10V.

※ 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 VR1(ZERO), VR2(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(ZERO) by VR1(ZERO)
- ② Adjust voltage difference with 10V when display weight is 0(ZERO) and Max. weight by VR2(SPAN)
- ③ Adjust voltage with 0V when display weight is 0(ZERO) by VR 1(ZERO).

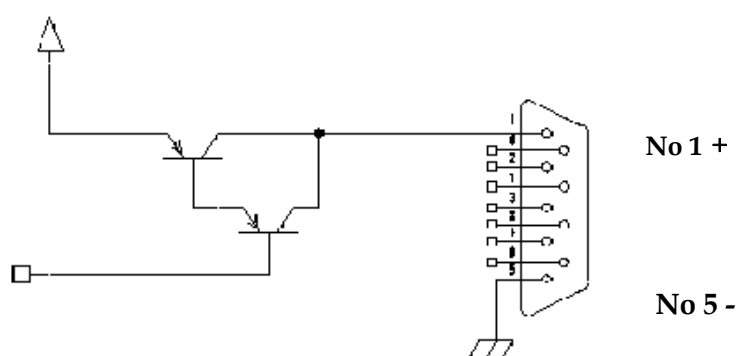
5-5-3I OP -06 Electric current (4 -20mA) ANALOG OUT

- Voltage output occurs proportionally according to the weight range In 4 ~20 mA
- Type of voltage output can be adjusted according to SET UP F60

☒ Specification

output Voltage	4 ~ 20 mA DC Current out
Precision	Max 1/3000
Min. Load Impedance	More than 500 Ω

☒ Connector Pin Diagram(9P D-TYPE Female & Current out circuit)



※ 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 VR1(ZERO), VR2(SPAN) located in Analog output PCB inside Digital Indicator.

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

- ① Adjust voltage with 4mA when display weight is 0(ZERO) by VR1(ZERO)
- ② Adjust voltage difference with 16mA when display weight is 0(ZERO) and Max. weight by VR2(SPAN)
- ③ Adjust voltage with 4mA when display weight is 0(ZERO) by VR 1(ZERO).

5-5-4. OP-07 PRINTER

- This printer Interface have Centronics Parallel and Serial system.
- SERIAL is from 1 to 999999
- CODE figure is 6(six) 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 stoppage of the power

PRINTER SHEET SELECT		
F71-	Ⓞ	PRINT SHEET 0
	1	PRINT SHEET 1

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	

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

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

PIN NO.	Contents	PIN NO.	Contents
1	STROBE	14	N.C
2	D0	15	N.C
3	D1	16	N.C
4	D2	17	N.C
5	D3	18	GND
6	D4	19	N.C
7	D5	20	N.C
8	D6	21	N.C
9	D7	22	N.C
10	ACK	23	N.C
11	BUSY	24	N.C
12	N.C	25	N.C
13	N.C		

5-5-5. OP-10 BCD INPUT.

Parallel BCD input is used to change the PART to 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
 - In case PART 19 displayed with BCE CODE such as 0001 10001

0 = OFF, 1 = ON

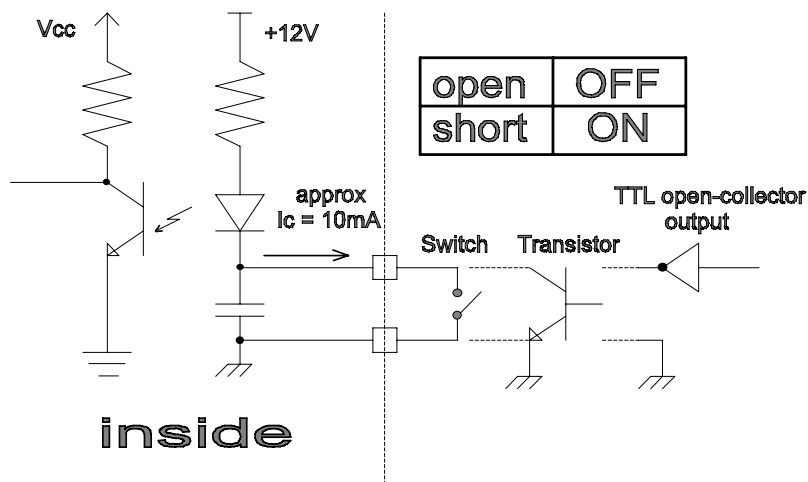
☒ 15P D-Type Female Connector

When a additional Input needs, Additional Input will be used except of the external 4EA.

☒ BCD INPUT CIRCUIT

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	EARTH (GND)
10	
11	AID INPUT 1
12	AID INPUT 2
13	AID INPUT 3
14	AID INPUT 4
15	EARTH (GND)





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