F741-C WEIGHING INDICATOR

OPERATION MANUAL

UNIPULSE

11 Nov. 2009
Rev. 1.00

Introduction

We appreciate your kind purchase of F741-C Weighing Controller.The F741-C is a weighing indicator for load cell(s). It is best suited for checker and hopper scale measurements.To take full advantage of high performance of F741-C, thoroughly read this operating manual first before use and understand the explanations contained herein for correct operating procedures.Also, carefully store this instruction manual so that it can be referred to at any time.

Safety Precautions

BE SURE TO READ FOR SAFETY

Installation, maintenance and inspection of the F741-C should be performed by personnel having technical knowledge of electricity.

In order to have an F741-C Weighing Controller used safely, notes I would like you to surely follow divide into " ⚠ WARNING " and " ⚠ CAUTION ", and are indicated by the following documents. Notes indicated here are the serious contents related safely. Please use after understanding the contents well.Please use after understanding the contents well.

⚠ WARNING

This sign forewarns the presence of hazards that could result in serious injury or fatality when incorrectly handled.

⚠ CAUTION

This sign forewarns the presence of hazards that could result in personnel injury or property damage when incorrectly handled.

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This sign forewarns the presence of hazards that could result in serious injury or fatality when incorrectly handled.

Warning on design

- For the entire system to function safely when the F741-C becomes faulty or malfunctions, provide a safety circuit outside the F741-C.
- Before using the F741-C as described below, make sure to consult with our sales personnel.
  - Use in environments not described in the operation manual.
  - Use greatly impacting human lives and assets, such as medical devices, transport devices entertainment devices, and safety devices.

Warning on installation

- Do not disassemble, repair, or modify the F741-C. Doing so may cause a fire or an electric shock.
- Do not install in the following environments.
  - Places containing corrosive gas or flammable gas.
  - Where the product may be splashed with water, oil or chemicals.

Warning on wiring

- Do not connect a commercial power source directly to the signal input/output terminals.
- Be sure to ground the protective ground terminal.
- The attached AC cable is designed for domestic use in Japan, and its rating is 125V AC, 7A. For use at voltages exceeding the rating and for overseas use, have a separate AC cable prepared.
- Before performing the following, make sure that no power is applied.
  - Attachment/detachment of connectors of options, etc.
  - Wiring/connection of cables to the signal input/output terminals.
  - Connection to the ground terminal.
- For connection to the signal input/output terminals, check the signal names and pin assignment numbers, and then carry out wiring properly.
- After wiring, be sure to mount the attached terminal board cover. Otherwise, it may cause an electric shock.
- To take measures against lightning surge, install a lightning surge protector (optionally available).
- Do not connect anything to unused terminal(s).
- Before applying power, carefully check the wiring, etc.

Warning during startup and maintenance

- Use a power supply voltage and load within the specified and rated ranges.
- Do not damage the power cord. Doing so may cause fire or electric shocks.
- Do not touch any signal input/output terminal while applying power. Doing so may cause electric shocks or malfunctions.
- If the cover of the main body is opened, it may cause an electric shock internally. Even if the power is off, the internal capacitor is charged. Contact us for internal inspection or repair.
- In the case of smoke, an abnormal smell or strange sound, immediately turn off the power, and disconnect the power cable.

⚠ CAUTION

This sign forewarns the presence of hazards that could result in personnel injury or property damage when incorrectly handled.

Caution on installation

- Use the F741-C as it is incorporated in a control panel, etc.
- Do not install in the following environments.
  - Where the temperature/humidity exceeds the range of the specifications.
  - Where the temperature changes remarkably or there is a danger of freezing or condensing.
  - Outdoors, or where the altitude exceeds 2000m.
  - Places exposed to direct sunlight
  - Dusty places
  - Places containing large quantities of salt or iron powder.
  - Where the main body is directly affected by vibrations or shocks.
- Take adequate shielding measures when using at the following locations.
  - Near a power line.
  - Where a strong electric field or magnetic field is formed.
  - Where static electricity, relay noise or the like is generated.
- Install the F741-C as far away from devices generating high frequency, high voltage, large current, surge, etc., as possible. Also, carry out wiring separately from their power lines. Do not carry out parallel wiring and common wiring.
- Do not use it, broken down.

Caution on wiring

- Tighten the screws for the signal input/output terminals at the specified torque.
  If they are loose, shorts, fire or malfunctions may occur.
  Tightening torque: 0.5N•m
- For sensors, external inputs/outputs and options, use shielded cables.

Caution during startup and maintenance

- For turning on/off the power, be sure to keep intervals of 5 seconds or more.
- After power-on, make sure to warm up the F741-C for at least 30 minutes or more before use.
- If the F741-C is not used by the specified method, its protective performance may be impaired.
- Maintenance
  - When performing maintenance, disconnect the power.
  - Do not wipe with a wet rag, or with benzine, thinner, alcohol, etc. Doing so may cause discoloration or deformation of the F741-C. In the case of heavy contamination, wipe off the contamination with a cloth after dipping it into a diluted neutral detergent and wringing it well, and then wipe with a soft, dry cloth.

Caution during transportation

- When the F741-C is shipped, spacers made of corrugated cardboard are used as cushioning materials.
  Though it is factory-designed so that shocks can sufficiently be absorbed, breakage may result if shocks are applied when the spacers are reused for transportation. If you send the F741-C to us for repair, etc., take adequate measures against shocks by using polyurethane materials, etc., separately.

Caution during disposal

- If you dispose of the product, handle it as industrial waste.

RoHS-compliant product

The parts and attachments (including the instruction manual, packaging box, etc.) used for this unit are compliant with the RoHS Directive restricting the use of hazardous substances with regard to adverse effects on the environment and human body.

Please inquire of our sales person about the RoHS-compliance of the option.

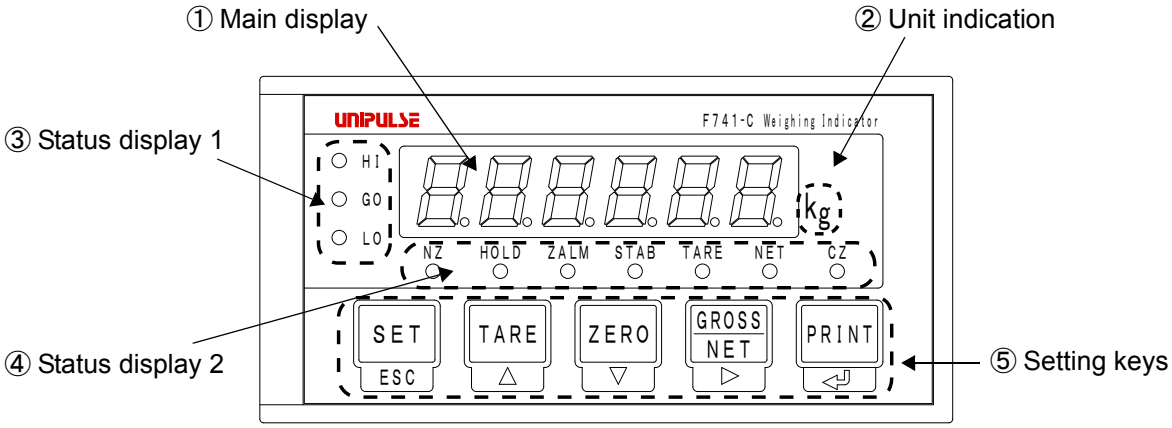
What is RoHS?

It is an abbreviation for Restriction on Hazardous Substances, which is implemented by the European Union (EU). The Directive restricts the use of six specific substances in electric and electronic equipment handled within EU borders. The six substances are lead, mercury, cadmium, hexavalent chromium, PBB (polybrominated biphenyls), and PBDE (polybrominated diphenyl ethers).

CONTENTS

1.APPEARANCE DESCRIPTION

1-1. Front panel



① Main display

The following three types are displayed.

(1) Weight value display

Displays the Gross weight or the Net weight.

In the case of a calibration error, the display shows the error and weight value alternately.

(2) Over scale and error display

Over scale, sequence errors and calibration errors are displayed.

※ Please refer to "9.OVER SCALE & ERROR" on page 93.

(3) Setting value display

Various setting values are displayed.

② Unit indication

The unit can be selected from g, kg, t, lb, N, oz, kN, and no unit.

If you use any unit other than kg, affix the included label.

③ Status display1

The contents of the display differ according to the setting state of the comparison mode.

● When comparison mode 0 (upper/lower limit comparison mode) is set

HI Lights when the weight value > upper limit setting value. " ● HI "

GO Lights when
the lower limit setting value ≦ weight value ≦ upper limit setting value.
" ● GO "

LO Lights when the weight value < lower limit setting value. " ● LO "

● When comparison mode 1 (over/under comparison mode) is set

HI Lights when the weight value > (target value + over). " ● HI "

GO Lights when (target value - under) ≦ weight value ≦ (target value + over).
" ● GO "

LO Lights when the weight value < (target value - under). " ● LO "

● When comparison mode 2 (discharging control mode) is set

COMPL Lights while the COMPLETE signal is output. " ● COMPL "

SP2 Lights when the weight value ≧ (final - compensation). "● SP2"

SP1 Lights when the weight value ≧ (final - Set point 1). "● SP1"

＊ If Set point 1 = 0, SP1 is always unlit.

※ For the discharging control mode, affix the attached "COMPL/SP2/SP1" label to "HI/GO/LO."

④ Status display2

NZ Lights when the weight value ≦ near zero setting value. " NZ ● "

※ The type of weight value is determined by near zero comparison mode (weighing function 1 in setting mode 2-7).

HOLD Lights while the weight value is held. " HOLD ● "

※ However, there is a need to set the auto print mode to 2 (auto print ON, weight value hold).

ZALM Flashes when the total amount of digital zero exceeds the DZ regulation value in digital zero or zero tracking operation. " ZALM ✳ "

STAB Lights when the weight value is stable. " STAB ● "

※ For the definition of stability, see

"4-11.Motion detection(MD) (Setting mode 2-3,2-4,2-8)" on page 41.

TARE Lights when Tare subtraction is performed. " TARE ● "

NET Lights when net weight is displayed. " NET ● "

Goes out when gross weight is displayed. " NET ○ "

CZ • Lights at a true zero point (0 ± 1/4 scale division). " CZ ● "

(When the 1/4 scale division display is OFF under display selection in setting mode 3-5.)

• Lights at a true zero point (0 ± 1/4 scale division), and at the central point of the scale interval of the indicated value {indicated value ± (1/4 × min. scale division)}. " CZ ● "

(When the 1/4 scale division display is ON under display selection in setting mode 3-5.)

In this operation manual, the indications of the status display are shown as "(lights/lit) ● ," "(goes out/unlit) ○ ," and "(flashes/flashing) ☼ ".

⑤ Setting keys

SET / ESC < SET >

If this key is pressed when a weight value is displayed, it switches to setting mode display. There are four setting modes : 1 to 4, which switches each time the GROSS / NET ▶ key is pressed.

< ESC >

If this key is pressed while a setting mode is displayed or a setting item is displayed, weight value display is brought back.

< TARE >

If this key is pressed, tare subtraction is immediately performed, and the net weight is zeroed. At the same time, " TARE ● " lights.

※ Clear the tare alarm by pressing the PRINT key while pressing the TARE key.

< ▲ >

This key functions to switch to setting item display while a setting mode is displayed, and to change the selected item number while a setting item is displayed.
Also, while an item is changed, it functions to increment the numerical value of the selected digit by one.

< ZERO >

If this key is pressed, the gross weight is immediately zeroed.
If this operation is performed in an area exceeding the DZ regulation value, the DZ regulation value is subtracted from the gross weight, and a zero alarm results. At the same time, " ZALM ✳ " flashes.

※ Clear the zero alarm by pressing the PRINT key while pressing the ZERO key.

< ▼ >

This key functions to switch to setting item display while a setting mode is displayed, and to change the selected item number while a setting item is displayed.
Also, while an item is changed, it functions to decrement the numerical value of the selected digit by one.

< GROSS/NET >

If this key is pressed when a weight value is displayed, it switches immediately between gross weight and net weight.

If this key is pressed when gross weight is displayed(" NET ○ " is unlit), it switches to net weight display, and if this key is pressed when net weight is displayed (" NET ● " is lit) , it switches to gross weight.

< ► >

This key functions to increment the selected setting mode by one while a setting mode is displayed. While an item is changed, it functions to move over digits.

< PRINT >

By pressing this key, the RS-232C format can be sent.

※ To send the RS-232C format, there is a need to make the following settings in advance.

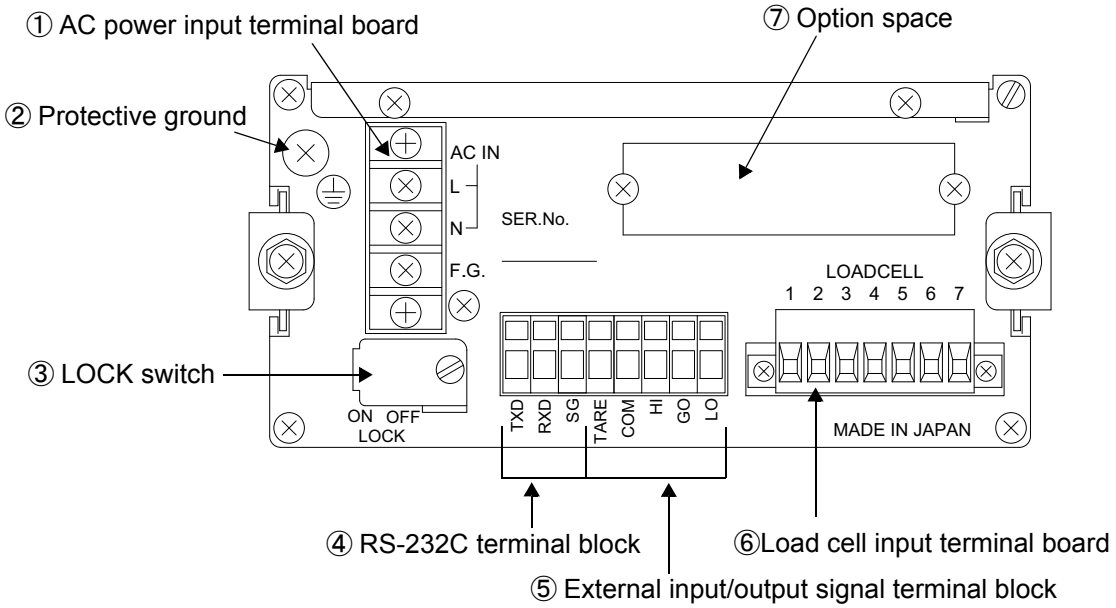
- Set the auto print mode (weighing function 1 in setting mode 2-7) to 0 (auto print OFF).
- Set the communication mode (RS-232C I/F setting in setting mode 4-1) to any of 4 to 6.

< ⏎ >

This key functions to start item change while a setting item is displayed, and it functions to determine the setting item while an item is changed.

The functioning of TARE, ZERO, and GROSS/NET can be disabled by the setting of "function key invalid" (setting mode 2-9).

1-2. Rear panel



① AC power input terminal board

Connect AC power code. The input voltage is 100V ~ 240V AC(+10% , -15%).
The frequency is 50/60Hz.

② Protective ground

This is a protective ground terminal board. Be sure to ground the protective ground terminal to prevent electric shocks and failures due to static electricity. (The frame and the protective ground terminal are conducted.)

③ LOCK switch

LOCK switch for avoiding changes of setting value, it prohibits to change setting value while the switch is ON.

④ RS-232C terminal block

RS-232C connector for receiving and transmitting weight data and status information.

⑤ External input/output signal terminal block

This is a terminal block to input external signals and output external signals.The Input/ Output circuit and internal circuit are photocoupler-insulated electrically.

※ For use in discharging control mode, affix the attached "COMPL/SP2/SP1" label to the "HI/GO/LO" part.

⑥ Load cell input terminal board

This is a terminal board to connect load cell(s).

The applicable terminal board is Osada-manufactured ETB42-07P.

⑦ Option space

One of the following options can be mounted.

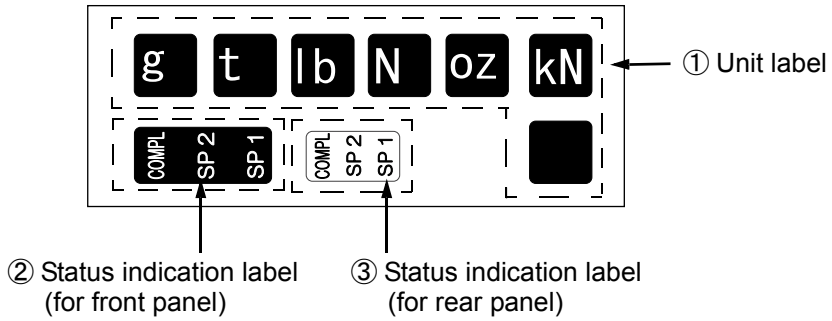
・D/A converter (DAC)

・PROFIBUS interface (PRF)

1-3. Unit and status indication label

The F741-C includes a unit and status indication label.

The label consists of the following three parts : ① to ③ . Affix them to the specified places from (a) to (c) according to application before use.



① Unit label

If you use any unit other than kg for indicated values, select a corresponding unit label, and affix it to the front panel (a).

If you use kg, no label needs to be affixed.

② Status indication label (for front panel)

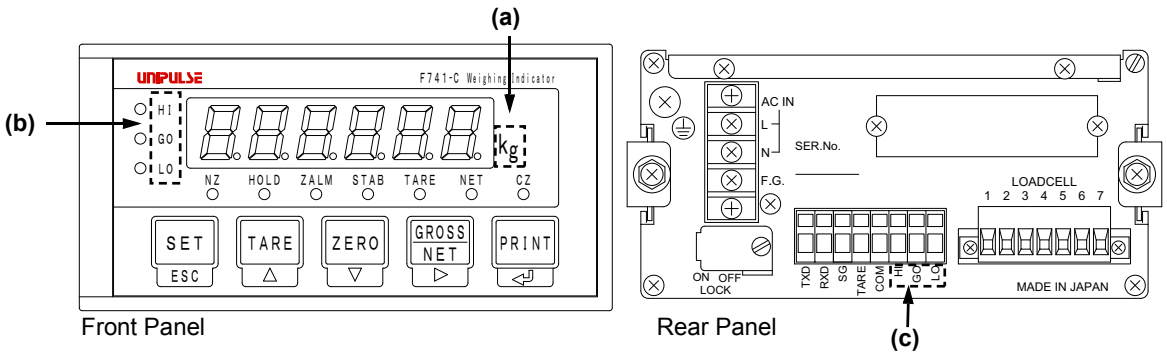
If you use discharging control mode, affix it to the front panel (b).

If you use upper/lower limit comparison mode or over/under comparison mode, there is no need to affix it.

③ Status indication label (for rear panel)

If you use discharging control mode, affix it to the rear panel (c).

If you use upper/lower limit comparison mode or over/under comparison mode, there is no need to affix it.



2. CONNECTION

Precautions about connection to the signal input/output terminal board are given below.The precautions described here are important for safety.
Please properly understand the descriptions before connection.

⚠ WARNING

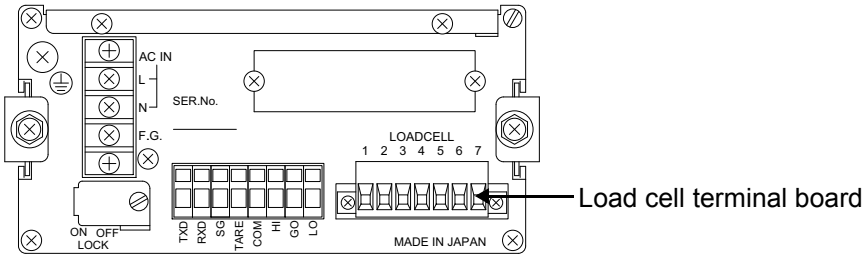
- Do not connect a commercial power source directly to the signal input/output terminals.
- Connect to the signal input/output terminals with no power applied because it may cause an electric shock.
- For connection to the signal input/output terminals, check the signal names and pin assignment numbers, and then carry out wiring properly.
- The F741-C can be used only in category II specified by EN61010.The overvoltage applied to the signal input/output terminals should not exceed the value defined in category II.
- After wiring, be sure to mount the attached terminal board cover. Otherwise, it may cause an electric shock.
- Before applying power, carefully check the wiring, etc.
- Do not touch any signal input/output terminal while applying power. Doing so may cause electric shocks or malfunctions.
- The F741-C conforms to the EMC Directive as an industrial environment product (class A). If it is used in a housing environment, interference may be caused. In that case, take appropriate measures.

⚠ CAUTION

- Tighten the terminal screws at the specified torque.
  If they are loose, shorts, fire or malfunctions may occur.
  Tightening torque: 0.5N•m
- Use shielded cables.

2-1. Load cell connection

The voltage application of F741-C is 10V, and the maximum current is 120mA, to which up to four 350Ω load cells can be connected in parallel.

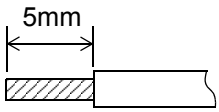


Load cell terminal board pin assignments

Pin No.	Signal (6-wire)	Signal (4-wire)
1	＋ SIG	＋ SIG
2	－ SIG	－ SIG
3	＋ EXC	＋ EXC (Connect 3 to 4)
4	＋ S	
5	－ EXC	－ EXC (Connect 5 to 6)
6	－ S	
7	SHIELD	SHIELD

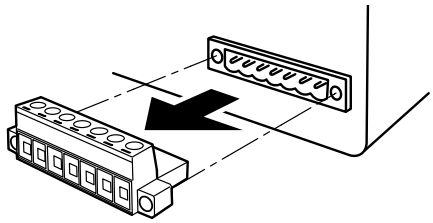
2-1-1. Method of connection

1)Peel the sheath of the wire to be connected 5mm.



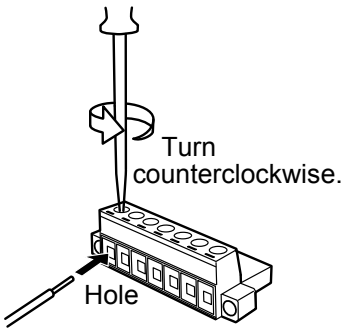
2)Twist the end to such an extent that it will not become loose.

3)Remove the terminal board from the F741-C body with a strong pull.



4)Loosen the screw with a screwdriver to open the hole.
A Phillips screwdriver with a shaft diameter of 3 ~ 3.5mm #1 is recommendable (precision screwdriver, etc.).

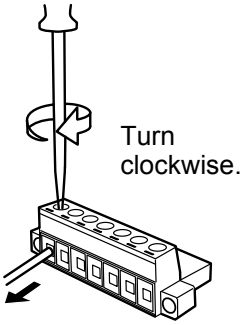
5)Insert the wire into the hole so as not to loosen the end.



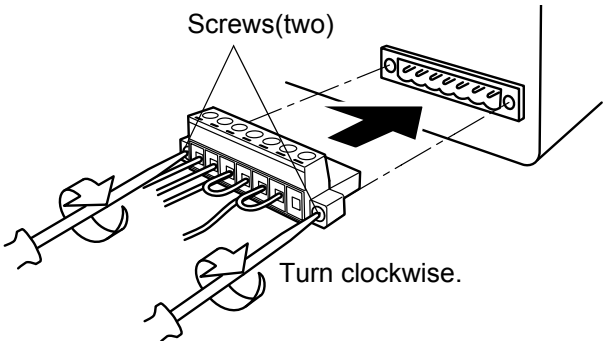
6)Tighten the screw with the screwdriver.

7)Lightly pull the wire to check that it is clamped securely.

※ Connectable wires are 0.21 ~ 3.31mm^2 (AWG12 ~ 24).
Recommendable tightening torque is 0.5Nm.

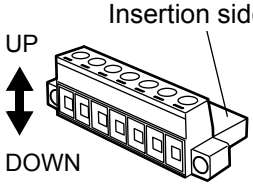


8)Insert the wire-connected plug into the F741-C body, and tighten the screws (two).



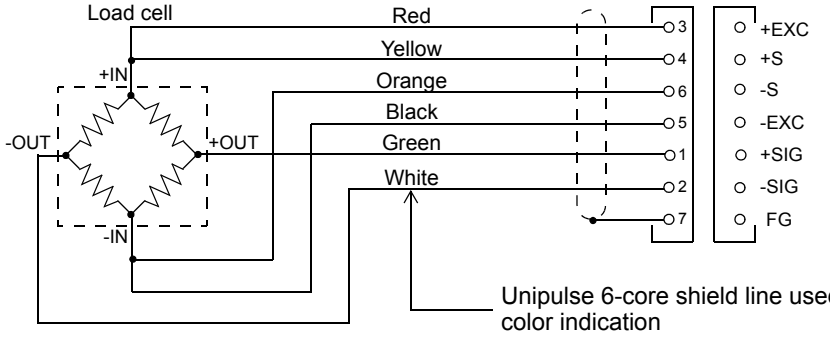
Request

When mounting the terminal board to the F741-C body, check its vertical orientation.
(See the illustration on the right-hand side.)



2-1-2. 6-wire connection

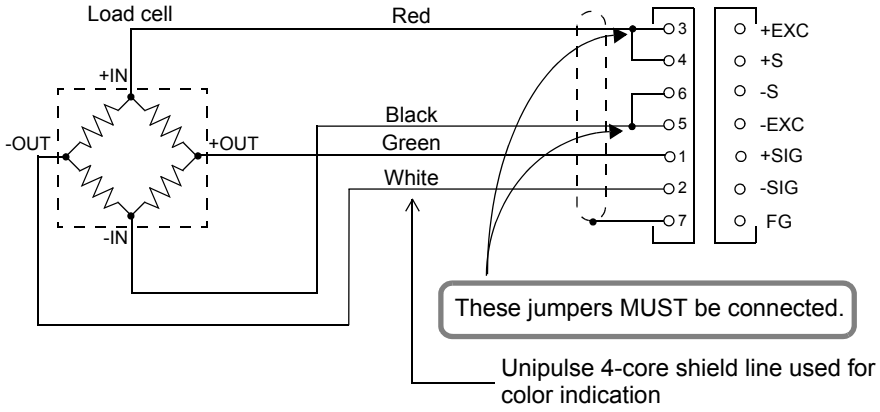
The load cell input of the F741-C is a 6-wire (remote sense) connection. 6-wire shielded load cell cable should be used and kept separate from AC or other noise generating wire.



※ Remote sense lines are used to detect and correct variations in excitation voltage over long cable runs.

2-1-3. 4-wire connection

Connect 3 and 4, and 5 and 6 as shown below.
Even 4 and 6 on the terminal board are open, normal operation is performed apparently, but heating or breakage may occur because excessive voltage is applied to the load cell.
For connection, use the accessory jumper lines.

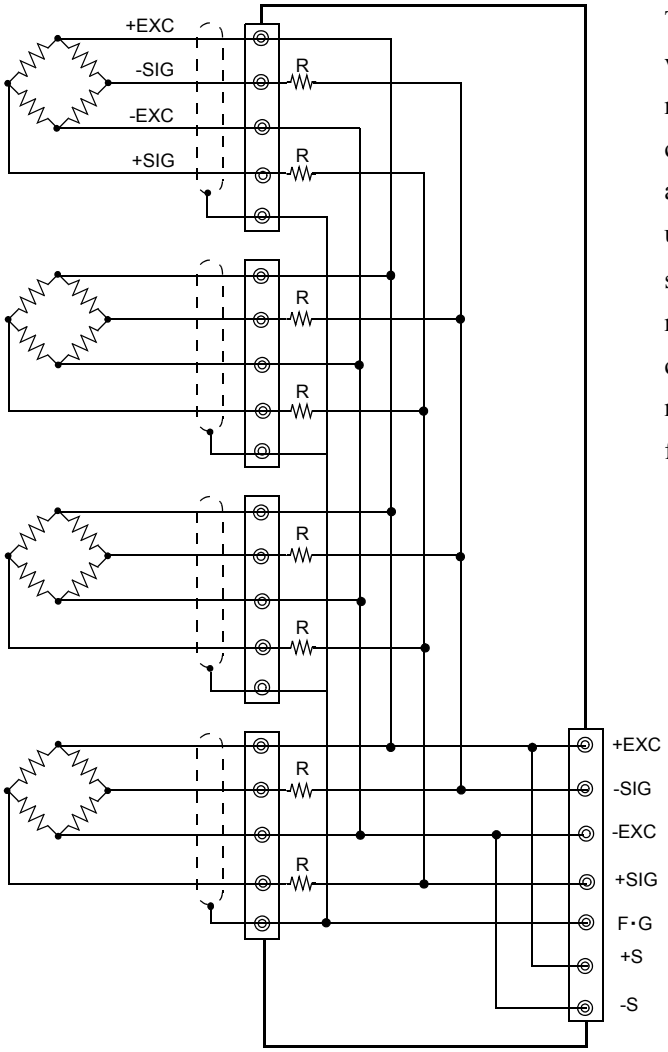


⚠ CAUTION

- The load cell excitation voltage of the F741-C is 10V. Heating or breakage may occur unless the load cells maximum excitation voltage is 10V or more.
- When using the F741-C with the four-wire load cell connected, be sure to connect +EXC and +S, and -EXC and -S. Even if +S and -S are not connected, normal operation is performed apparently, but heating or breakage may occur because excessive voltage is applied to the load cell.

2-1-4. Connecting load cells in parallel

In some industrial weighing apparatus, two or more load cells may be connected in parallel to form a hopper scale or track scale. The manner of connection is shown below. Parallel connection can simply be made by using the optionally available B410 (summing box for 4-point multi load cell).



The group of "n" parallel load cells viewed from this device side can be regarded as a unit load cell the rated capacity of which is multiplied by "n" and the sensitivity of which is unchanged. The averaging resistance (R) should be 300 ~ 500 Ω, equal in relative ratio and excellent in temperature coefficient. No averaging resistance is needed if load cells with consideration for parallel connection are used.

Request

When connecting several load cells in parallel, load cell capacity should be higher than expected load to compensate for mechanical shock or eccentric loading.

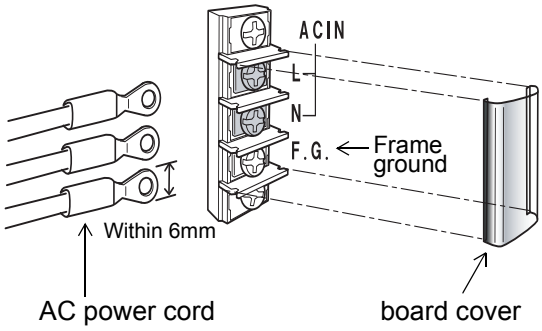
2-2. Connecting power input terminal

Connect the AC power cord. The input voltage is 100V to 240V AC.
The frequency is 50/60Hz.

1) Make sure that no power is applied.

2) Remove the terminal board cover.

3) Remove the three screws(M3) at the lower left of the terminal board, align the crimp contacts with the screw holes, and then tighten the screws.



4) Mount the terminal board cover.

2-3. Connection of the protective ground

The grounding terminal is for prevention of electric shocks and failures caused by static electricity.

Use an approx. 0.75mm^2 thick wire, and be sure to ground.

⚠ WARNING

- Connect with no power applied because it may cause an electric shock.
- The attached AC cable is designed for domestic use in Japan, and its rating is 125V AC, 7A. For use at voltages exceeding the rating and for overseas use, have a separate AC cable prepared.
- Since the F741-C has no power switch, install a breaker.
- Be sure to ground the protective ground terminal to prevent electric shocks and failures by static electricity. (The frame and protective ground terminal are conducted.)
  Do not use other screws than that attached to the main body .
- To take measures against lightning surge, install a lightning surge protector (optionally available).

2-4. Connection of the RS-232C and external input/output signal terminal blocks

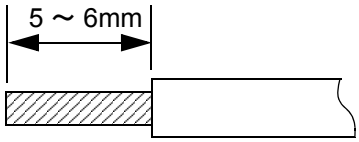
RS-232C and external insertion Output terminal stand are the cage clamping types.

As wiring materials, use shielded cables.

Connect to the cage clamp type terminal board by using the attached mini screwdriver.

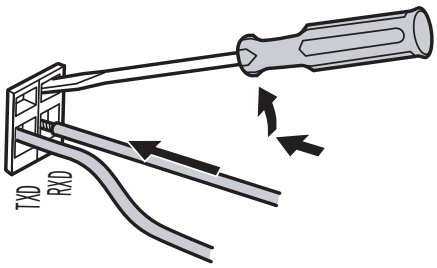
1)Strip the casing 0.2in (6mm) on the cable to be connected.

Twist the bare wire to fit the terminal hole.



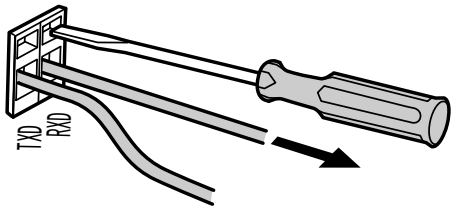
2)Insert the supplied screwdriver into the upper hole and lift upward.

3) Insert the twisted wires into the lower hole.



4)Pull the screwdriver out from the upper hole.

5)Make sure cable is clamped securely and does not come out with a slight tug.

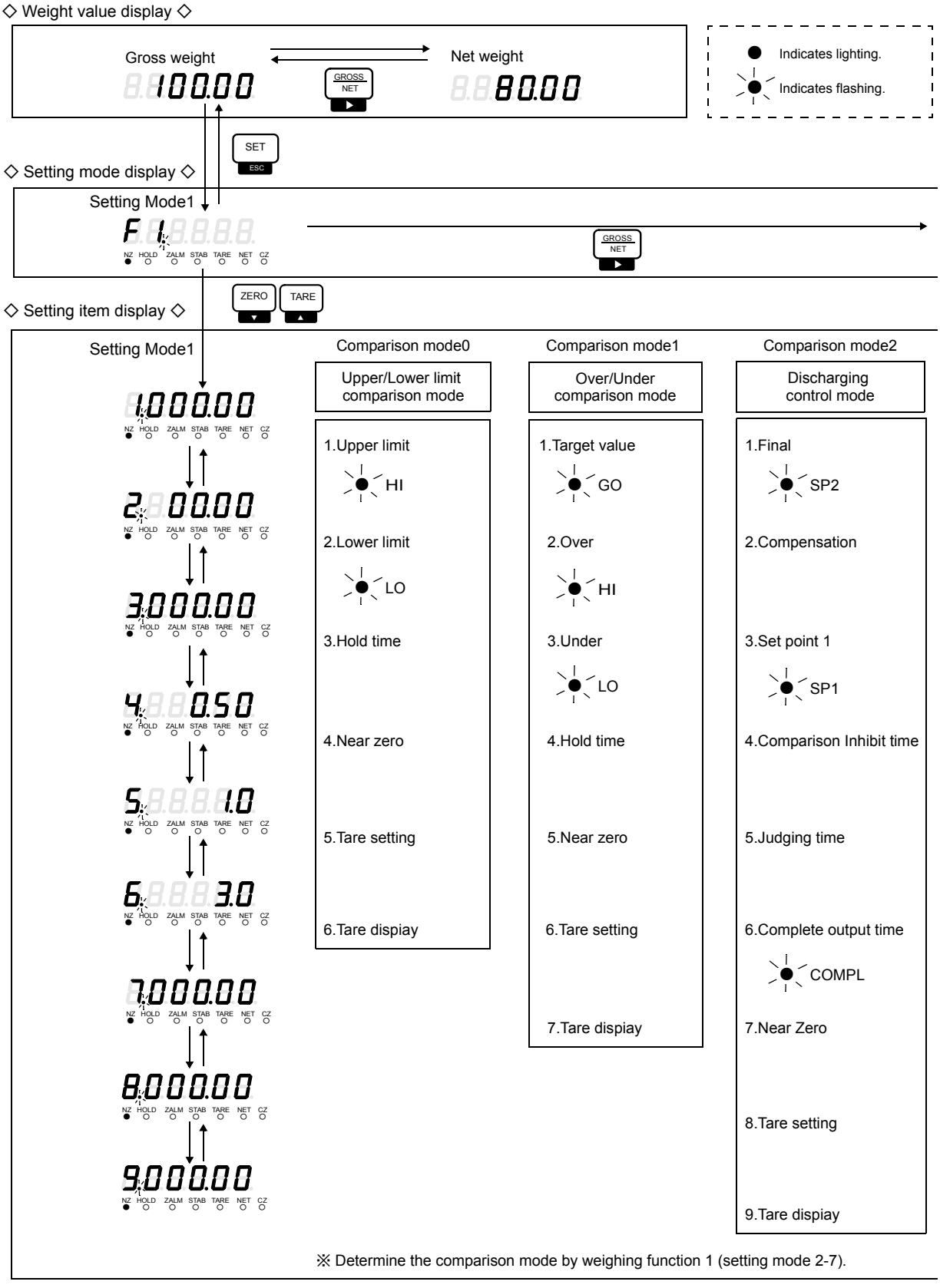


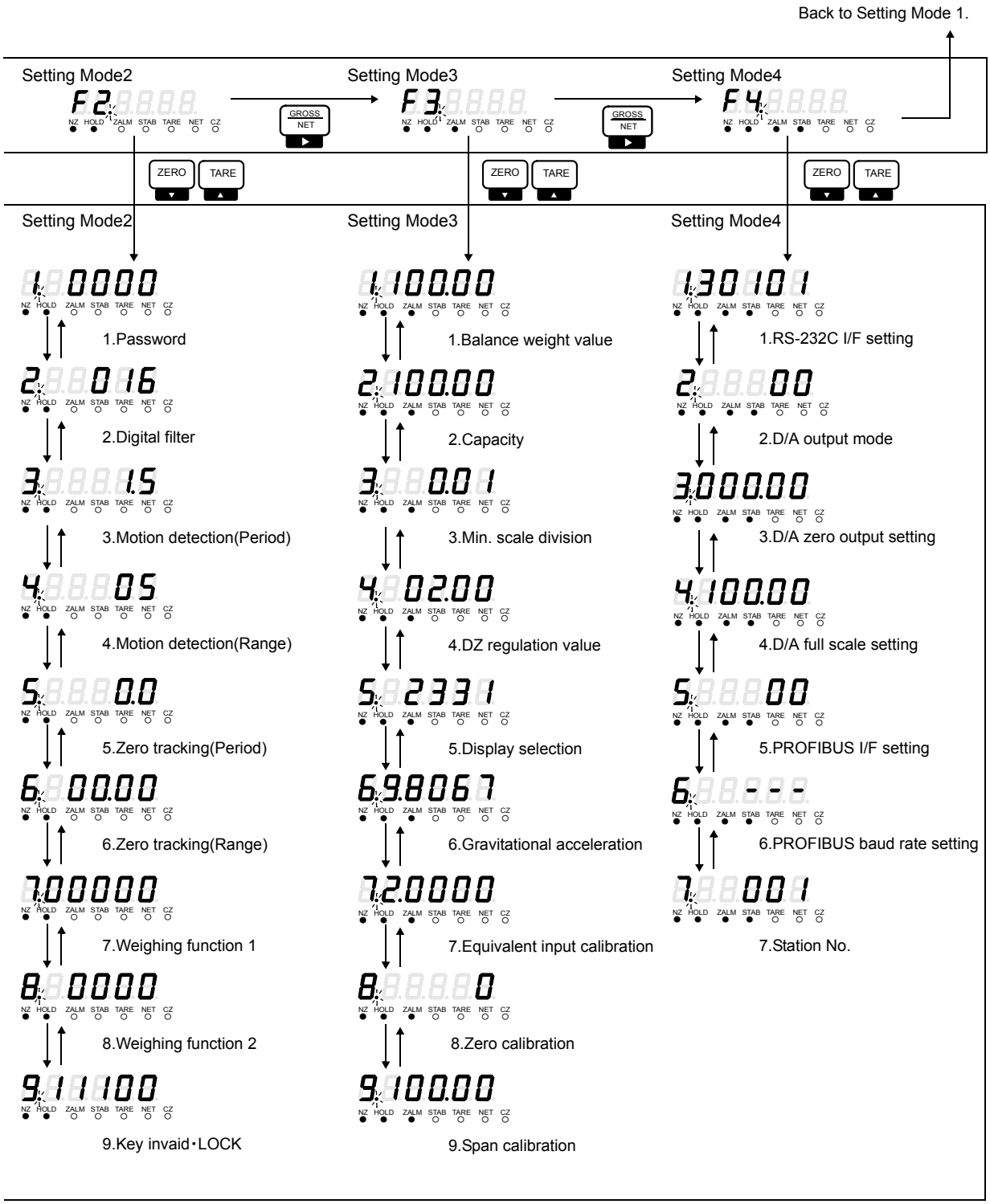
Request

- Cable can be from 24 ~ 14AWG (0.2 ~ 2.5mm^2).
- It is not necessary to solder the cable wires or to fix a solderless terminal.
- If several cables to be inserted to the same hole, twist those cable wires together and insert.

3. Setting mode configuration table

3-1. Setting mode chart



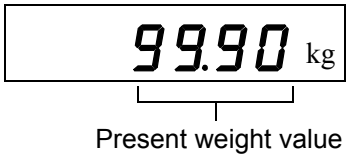

Back to Setting Mode 1.
Setting Mode2
Setting Mode3
Setting Mode4
GROSS NET
ZERO
TARE
1.Password
2.Digital filter
3.Motion detection(Period)
4.Motion detection(Range)
5.Zero tracking(Period)
6.Zero tracking(Range)
7.Weighing function 1
8.Weighing function 2
9.Key invaid･LOCK
1.Balance weight value
2.Capacity
3.Min. scale division
4.DZ regulation value
5.Display selection
6.Gravitational acceleration
7.Equivalent input calibration
8.Zero calibration
9.Span calibration
1.RS-232C I/F setting
2.D/A output mode
3.D/A zero output setting
4.D/A full scale setting
5.PROFIBUS I/F setting
6.PROFIBUS baud rate setting
7.Station No.

3-2. Setting procedure

Change settings in the order of "setting mode selection" → "setting item selection" → "setting value entry".

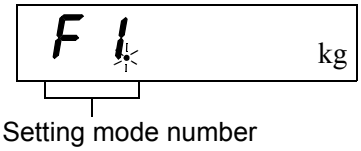
3-2-1. Method of selecting a setting mode

(Example) For selecting setting mode 3



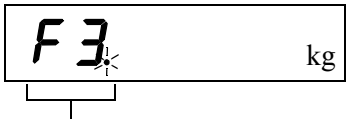
〔The weight value is displayed.
The mode number is not displayed.〕

1) Press the SET/ESC key when the weight value is displayed.



〔The display changes.〕

2) Press the GROSS/NET key twice.



〔The setting mode number changes.〕

If no operation is performed for 2 seconds or more while a setting mode number is displayed, it switches to setting item display in the specified mode.

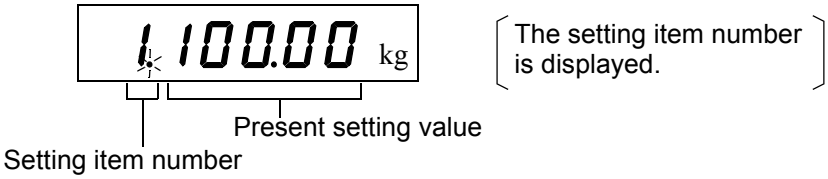
Also, if the SET/ESC keyis pressed while a setting mode number is displayed, weight value display is brought back.

3-2-2. Method of selecting a setting item and entering a setting value

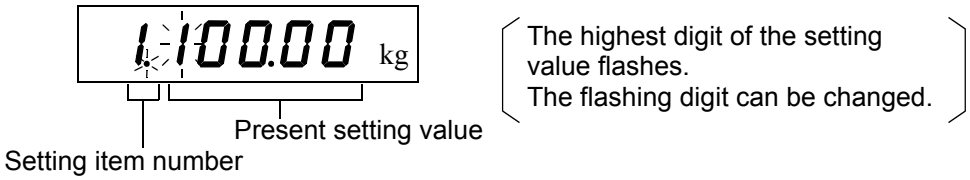
(Example 1) For setting the balance weight value to 50.00kg.
(Setting by numerical input.)

※ Hereinafter, it is assumed that setting mode 3 has already been selected for the operating procedure.

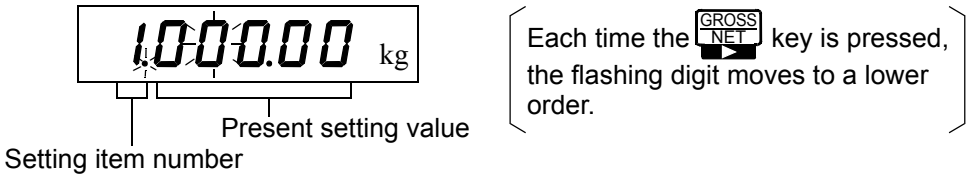
1) Select the setting item.
(Press the ZERO key when setting mode 3 is displayed.)



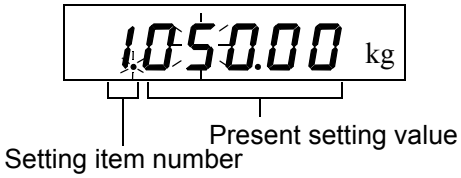
2) Press the PRINT key.



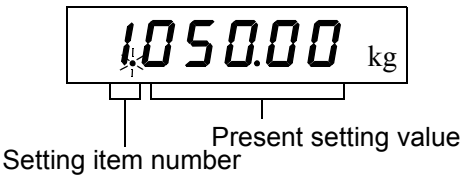
3) Input the setting value. In this case, make it "0" by pressing the ZERO key once, and move to one digit lower by pressing the GROSS NET key.



4) Set "5" by pressing the TARE key five times.



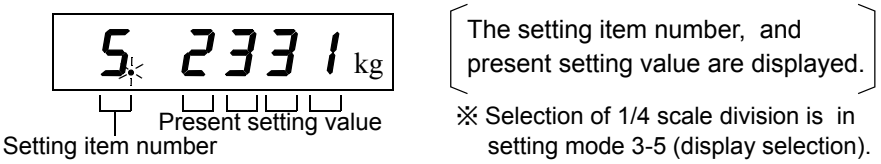
5) After the correct setting value is input, press the PRINT key to enter the setting value.



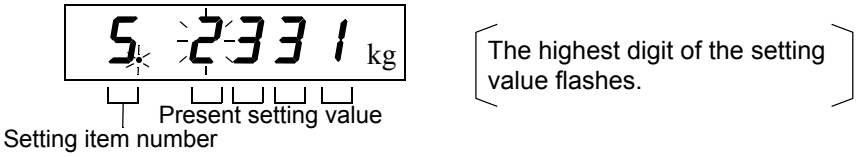
(Example 2) For setting the 1/4 scale division display to OFF .
(Setting from choices.)

※ Hereinafter, it is assumed that setting mode 3 has already been selected for the operating procedure.

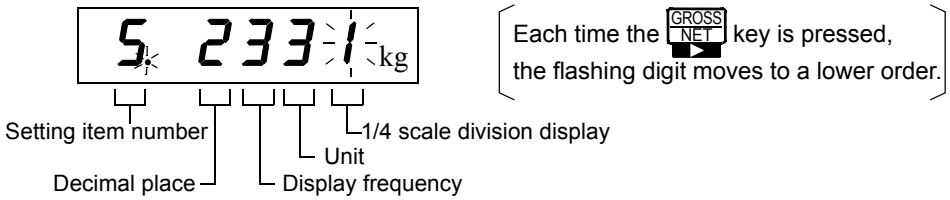
1) Select the setting item.
(Press the ZERO key five times when setting mode 3 is displayed.)



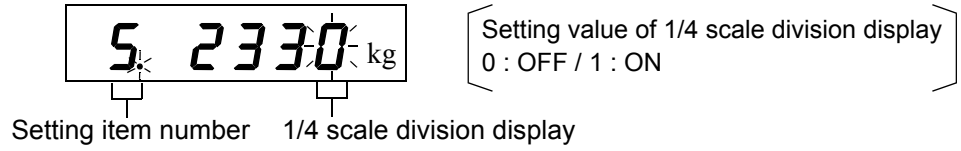
2) Press the PRINT key.



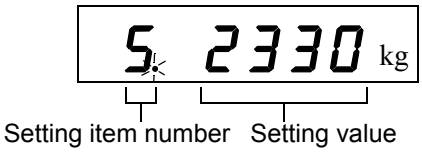
3) Make the lowest digit flash by pressing the GROSS NET key three times.



4) Select from choices.
(Since the 1/4 scale division display should be turned OFF in this case, set "0" by pressing the ZERO key once.)



5) Upon completion of entering the correct choice, confirm (determine) your entry by pressing the PRINT key.



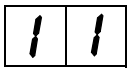
By pressing the SET ESC key when the setting item number is displayed (while changing a setting value after selecting an item), you can exit the item (weight value display is brought back.)

3-2-3. Setting mode 1

1) Comparison mode 0 (Upper/Lower limit comparison mode)

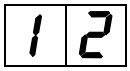
In comparison mode 0, upper/lower limit comparison is performed.

· Upper limit



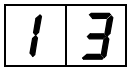
(0 ~ 99999)

· Lower limit



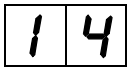
(0 ~ 99999)

· Hold time



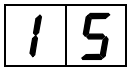
(0.0 ~ 9.9)

· Near zero



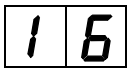
(0 ~ 99999)

· Tare setting



(0 ~ 99999)

· Tare display

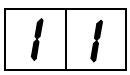


(0 ~ 99999)
※ Display only

2) Comparison mode 1 (Over/Under Comparison Mode)

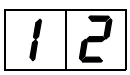
In comparison mode 1, over/under comparison is performed.

· Target value



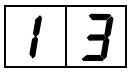
(0 ~ 99999)

· Over



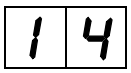
(0 ~ 9999)

· Under



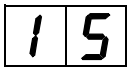
(0 ~ 9999)

· Hold time



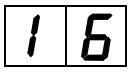
(0.0 ~ 9.9)

· Near zero



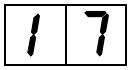
(0 ~ 99999)

· Tare setting



(0 ~ 99999)

· Tare display

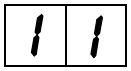


(0 ~ 99999)
※ Display only

3) Comparison mode 2 (Discharging control mode)

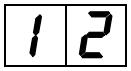
In comparison mode 2, discharging control is performed.

· Final



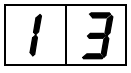
(0 ~ 99999)

· Compensation



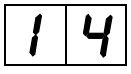
(0 ~ 9999)

· Set point 1



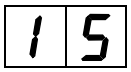
(0 ~ 99999)

· Comparison Inhibit time



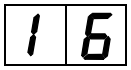
(0.00 ~ 9.99)

· Judging time



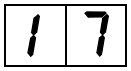
(0.0 ~ 9.9)

· Complete output time



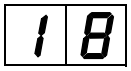
(0.0 ~ 9.9)

· Near zero



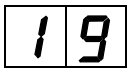
(0 ~ 99999)

· Tare setting



(0 ~ 99999)

· Tare display

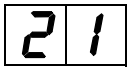


(0 ~ 99999)
※ Display only

3-2-4. Setting mode 2

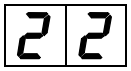
Setting mode 2 relates to internal functions.

· Password



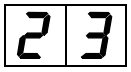
(0 ~ 9999)
※ For extension (unused)

· Digital filter



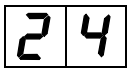
(1 ~ 128)

· Motion detection(Period)



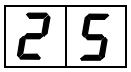
(0.0 ~ 9.9)

· Motion detection(Range)



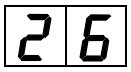
(0 ~ 99)

· Zero Tracking(Period)



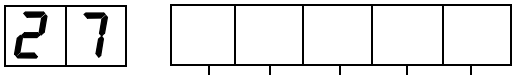
(0.0 ~ 9.9)

· Zero Tracking(Range)



(0 ~ 9999)

· Weighing function 1



Comparison mode
0 : Upper/Lower limit comparison mode
1 : Over/Under comparison mode
2 : Discharging control mode

Auto print mode
0 : Auto print OFF
(manual print valid)
1 : Auto print ON
(manual print invalid)
2 : Auto print ON, weight value hold
(manual print invalid)

Comparison timing
Comparison mode 0 :
Upper/Lower limit comparison mode
0 : Compare regularly
1 : Compare in a stable condition.
2 : Compare regularly except near zero.
3 : Compare in a stable condition except near zero.

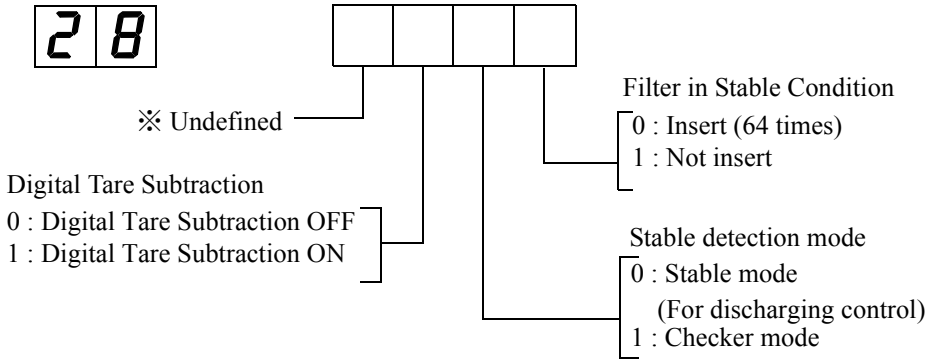
Comparison mode 1 :
Over/Under comparison mode
0 : Compare regularly
1 : Compare in a stable condition.
2 : Compare regularly except near zero.
3 : Compare in a stable condition except near zero.

Comparison mode 2:
Discharging control mode
(COMPLETE signal output timing)
0 : ON from when the judging timer has elapsed.
1 : ON from when stable condition is established after the judging timer has elapsed.
2 : ON from when the judging timer has elapsed or from when stable conditionis established.

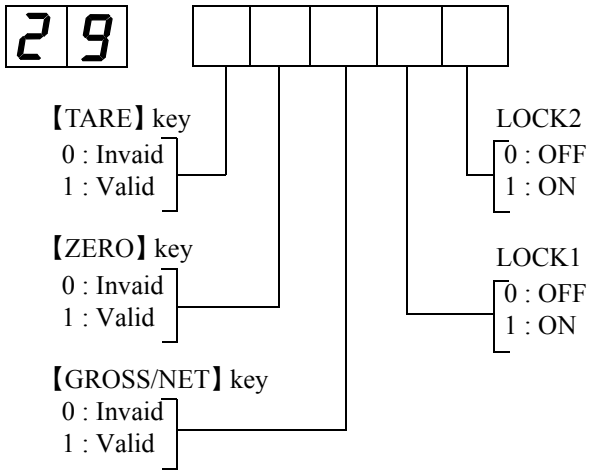
Near zero comparison mode
0 : Near zero signal ON when gross weight ≦ near zero setting value
1 : Near zero signal ON when net weight ≦ near zero setting value
2 : Near zero signal ON when |gross weight| ≦ near zero setting value
3 : Near zero signal ON when |net weight| ≦ near zero setting value
4 : Comparison OFF

Comparison weight value
Comparison weight in each comparison mode
0 : Goss weight
1 : Net weight
2 : Comparison OFF

· Weighing Function 2



· Function key invalid

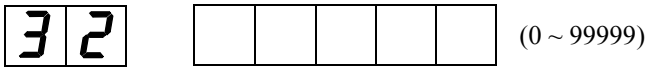


3-2-5. Setting mode 3

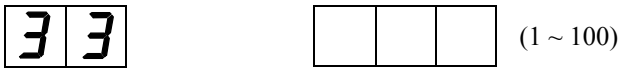
Setting mode 3 relates to calibration and display.

· Balance weight value

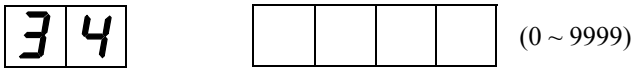
· Capacity



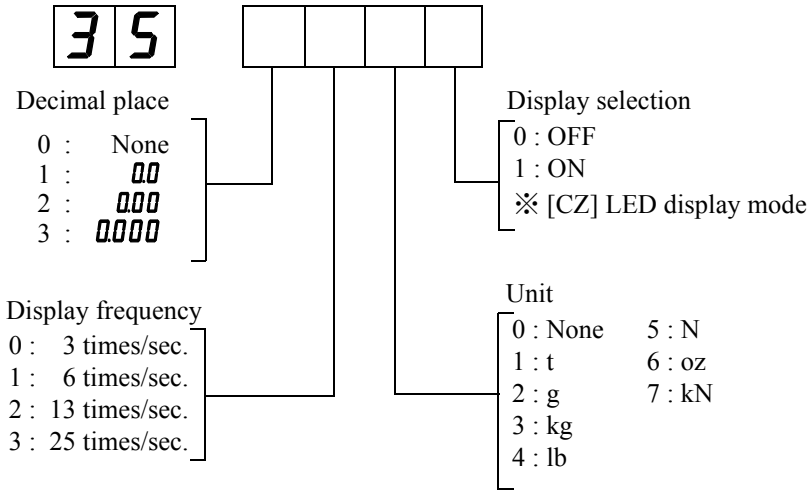
· Minimum scale division



· DZ regulation value

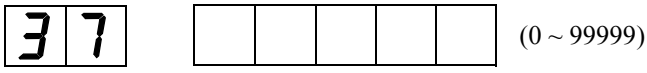


· Display selection



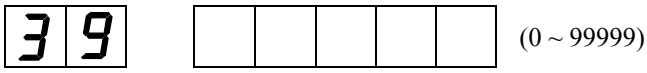
· Gravitational acceleration

· Equivalent input calibration



· Zero calibration

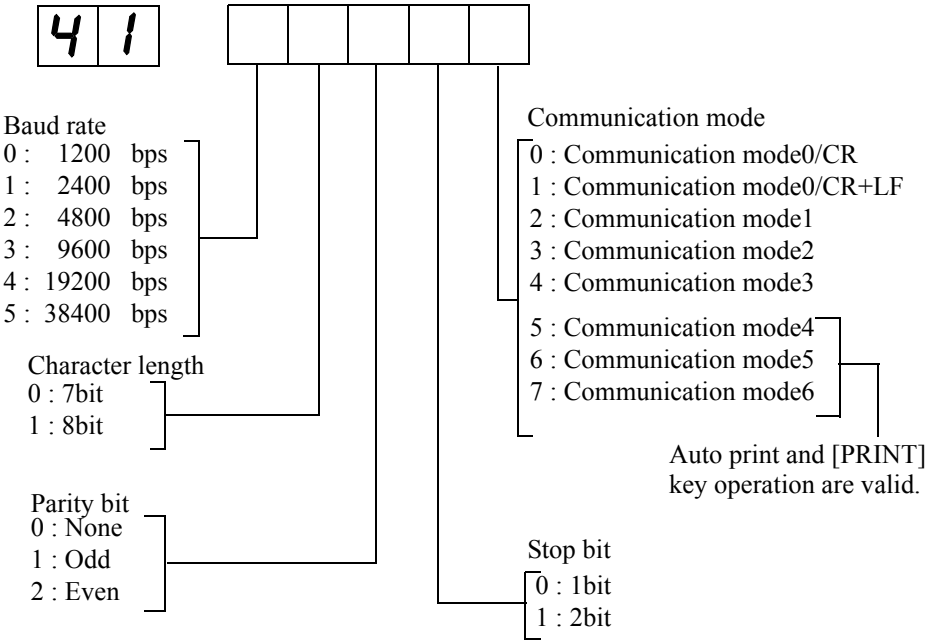
· Span calibration



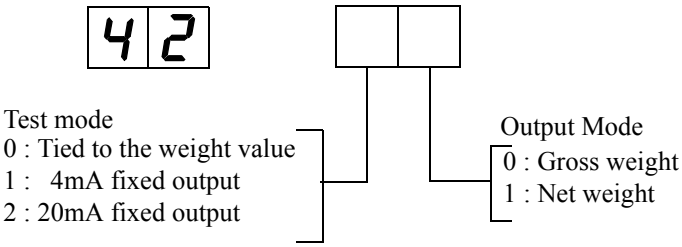
3-2-6. Setting mode 4

Setting mode 4 relates to interfaces.

· RS-232C I/F setting

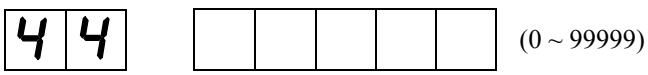


· D/A output mode

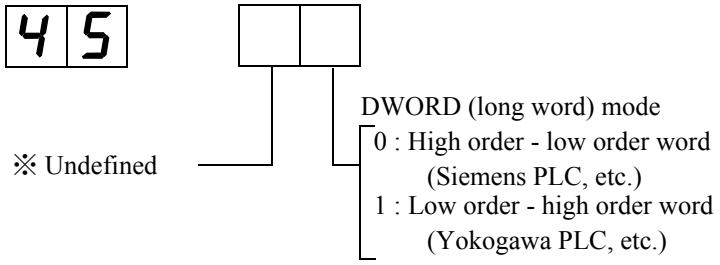


· D/A zero output weight

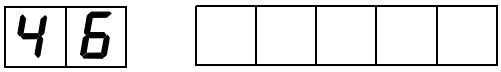
· D/A full scale setting



· PROFIBUS I/F setting

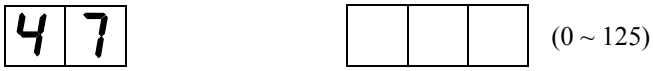


· PROFIBUS baud rate display



Display pattern					Function
			1	2	12 Mbps
				6	6 Mbps
				3	3 Mbps
			1.	5	1.5 Mbps
		5	0	0	500 kbps
	1	8	7.	5	187.5 kbps
	9	3.	7	5	93.75 kbps
		1	9.	2	19.2 kbps
			9.	6	9.6 kbps
	—	—	—	—	Not linked or no PROFIBUS I/F mounted

· Station No.

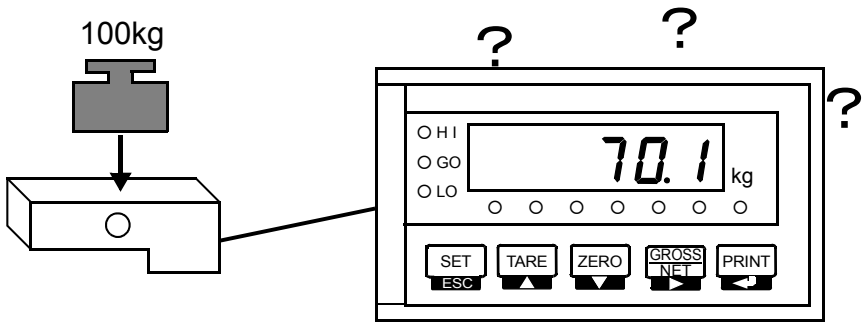


4. CALIBRATION

4-1. Span calibration

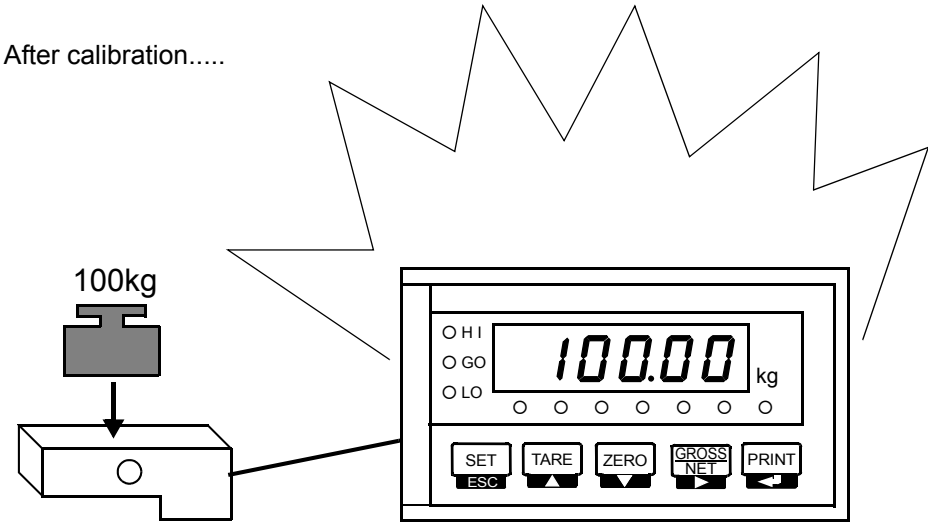
Calibration is performed for matching the F741-C to a load cell. For example, it is work to adjust so that the F741-C accurately displays 100.00kg when an actual load (or weight) of 100kg is applied to the load cell (balance section) of the weighing apparatus to which the F741-C is connected. This operation is called Span Calibration.

Connect F741-C to the load cell.....



The display is incorrect.....

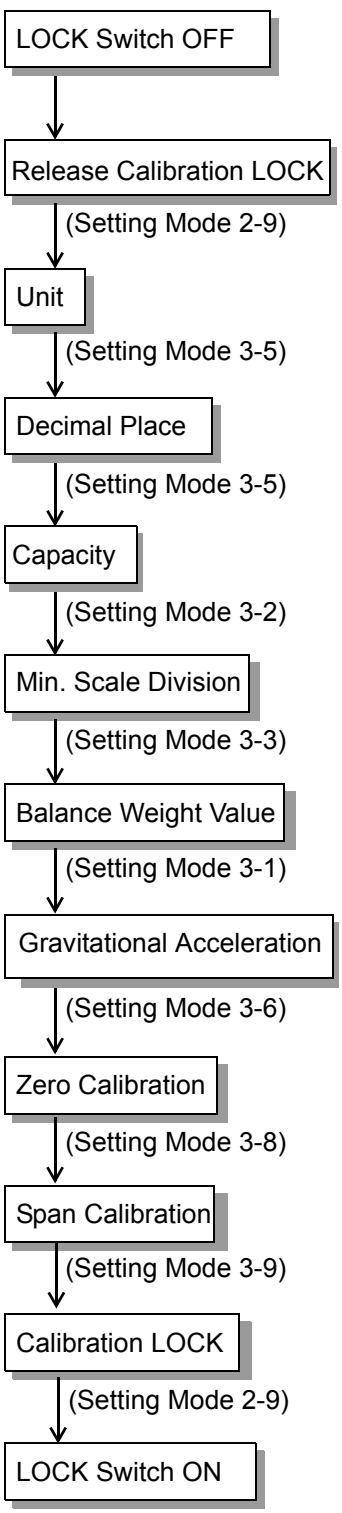
After calibration.....



The F741-C and load cell
function as a weighing device.

4-2. Span calibration procedure

Follow the steps below to perform Span Calibration.



Release calibration inhibit LOCK by the switch OFF on the rear panel.

Release Setting Value LOCK which inhibits the calibration.

The displayed unit is set.

Register the position of decimal point.

Register the maximum capacity of the scale.
If the registered value exceeds by 9 scale divisions, display shows over scale, "oFL2"

Register the minimum unit (scale division) of the scale.

Register the value of load (balance weight) for load cell.

Input the acceleration of the area in which calibration is performed.

Calibrate the initial zero point.

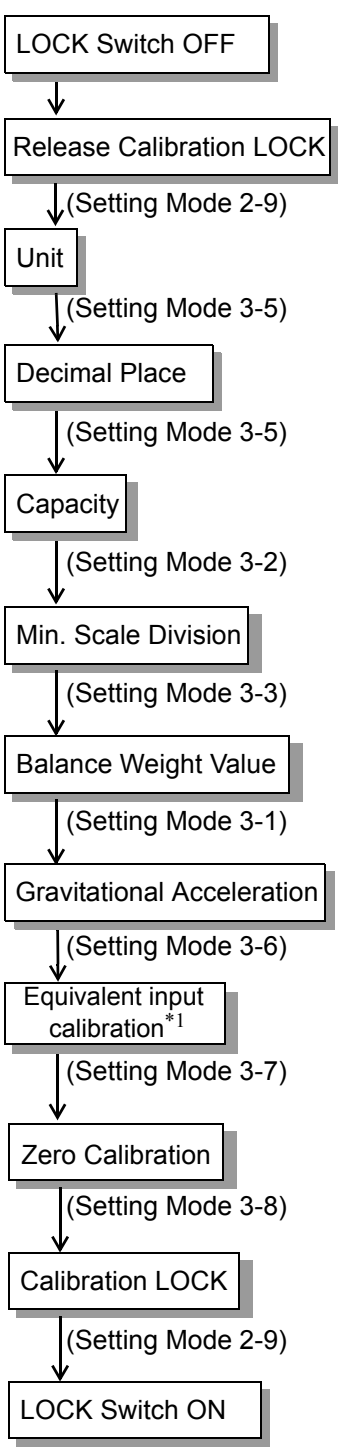
Place the load (balance weight) on the load cell and register the span value.

Disable changing setting value related to calibration.

Turn the calibration LOCK ON to prohibit the calibration for avoiding false operation.

4-3. Secondary calibration procedure (Equivalent input calibration)

Calibration procedure performed by entering the rated output value (mV/V) and rated capacity value of load cell without using real load.
Secondary calibration function is provided for provisional calibration when the F741-C develops trouble or the calibration value is mistakenly changed.
The secondary calibration is only a provisional method. Calibration with actual load must be done as soon as possible.



Release calibration inhibit LOCK by the switch OFF on the rear panel.

Release Setting Value LOCK which inhibits the calibration.

The displayed unit is set.

Register the position of decimal point.

Register the maximum capacity of the scale.
If the registered value exceeds by 9 scale divisions, display shows over scale, "oFL2" .

Register the minimum unit (scale division) of the scale.

Set the weight value corresponding to the output value to be entered in *1.

Input the acceleration of the area in which correction is performed.

Register the rated output value (mV/V) of load cell.

Calibrate the initial zero point.

Disable changing setting value related to calibration.

Turn the calibration LCOK ON to prohibit the calibration for avoiding false operation.

Request

- Set the Balance Weight Value to the Capacity or less.
- For performing calibration at the rated value according to the specifications of the load cell, set the Capacity to the same value as the rated value of the load cell.
- When connecting several load cells in parallel, it is possible to occur some differences between input and output value due to voltage drop caused by connection or material of lines.
  In this case, register actual input value to perform accurate calibration.
- If the area of calibration and the area of use are different, weight errors may occur due to a difference in gravitational acceleration. If you use units other than N and kN, input the acceleration of the area of use referring to the gravitational acceleration correction table on page 39.
  Use 9.8067(Initial value) when you use N or kN.

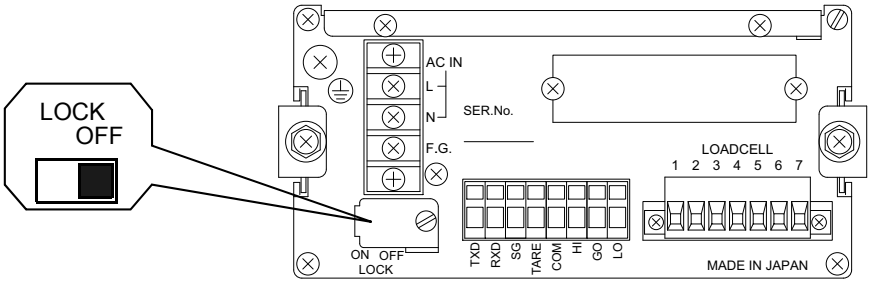
4-4. Preparation for calibration

4-4-1. LOCK release

F741-C features a LOCK function for disabling changes in calibration and setting values. The software LOCK is performed with the operation on the display; the hardware LOCK is located on rear panel. Release both of locks when the calibration is performed.

Operation

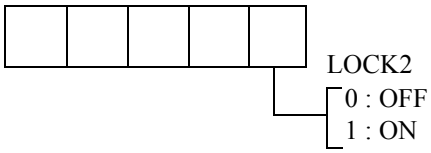
1) LOCK OFF on the rear panel



2) Select setting mode 2-9 (Function key invalid・LOCK).

3) Set LOCK2 to OFF.

Function key invalid・LOCK

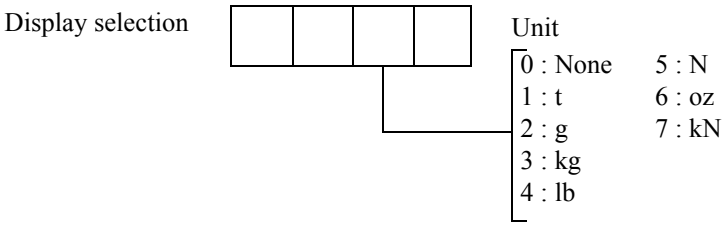


LOCK is released through above procedure. After the calibration is finished, LOCK ON to protect the calibration value.

Concerning LOCK and setting values to be protected, refer to "16.THE LIST OF INITIAL SETTING VALUE" on page 111.

4-4-2. Unit (Setting mode 3-5)

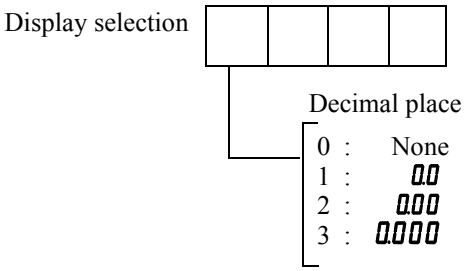
This is used in the RS-232C sending format or PROFIBUS I/F IN data.
Even if this setting is changed, it is not reflected in the display.
Select the unit from 0: none / 1: t / 2: g / 3: kg / 4: lb / 5: N / 6: oz / 7: kN.



4-4-3. Decimal place (Setting mode 3-5)

Set the decimal point position common to weight-related displays, setting items, etc., by this selection.

Select the decimal point position from 0: 0 / 1: 0.0 / 2: 0.00 / 3: 0.000.



In the F741-C, the decimal place is all fixed except for weight-related descriptions.
※ It cannot be changed.

4-4-4. Capacity (Setting mode 3-2)

Register the maximum capacity of the scale. If the registered value exceeds by 9 scale divisions, display shows over scale, "oFL2" .(Input range ／ 0 ~ 99999)

4-4-5. Minimum scale division (Setting mode 3-3)

Register the minimum unit (scale division) of the scale.

(Input range ／ 1 ~ 100)

4-4-6. Balance weight value (Setting mode 3-1)

Register the value of load (balance weight) before the Span Calibration.

(Input range ／ 0 ~ 99999)

4-4-7. Gravitational acceleration (Setting mode 3-6)

If the calibration location and installation location of the scale are different, correct the weight errors resulting from an area-to-area difference in gravitational acceleration by this function.

If the calibration location and installation location are in the same area, this setting is not needed.

Find the regional acceleration of the area in which actual load calibration is performed from the following gravitational acceleration correction table, set the value of the acceleration, and then perform actual load calibration. Now, the difference in gravitational acceleration from the calibration location is corrected.

Gravitational acceleration

Area	(G)	Area	(G)	Area	(G)
Amsterdam	9.8128m/s^2	Hanoi	9.7870m/s^2	Oslo	9.8191m/s^2
Athens	9.7999m/s^2	Havana	9.7883m/s^2	Ottawa	9.8066m/s^2
Auckland	9.7986m/s^2	Helsinki	9.8193m/s^2	Paris	9.8097m/s^2
Bangkok	9.7832m/s^2	Ho Chi Minh	9.7820m/s^2	Phnom Penh	9.7824m/s^2
Beijing	9.8155m/s^2	Hong kong	9.7878m/s^2	Rio de janeiro	9.7879m/s^2
Berlin	9.8129m/s^2	Kualalumpur	9.7805m/s^2	Rome	9.8034m/s^2
Birmingham	9.8127m/s^2	Kuwait	9.7928m/s^2	San Francisco	9.7994m/s^2
Brussels	9.8115m/s^2	Lisbon	9.8006m/s^2	Seoul	9.7995m/s^2
Buenos Aires	9.7970m/s^2	London	9.8120m/s^2	Shanghai	9.7946m/s^2
Kolkata	9.7878m/s^2	Los Angelse	9.7965m/s^2	Singapore	9.7804m/s^2
Capetown	9.7964m/s^2	Madrid	9.8021m/s^2	Stockholm	9.8186m/s^2
Chicago	9.8030m/s^2	Manila	9.7836m/s^2	Sydney	9.7961m/s^2
Copenhagen	9.8156m/s^2	Melbourne	9.7995m/s^2	Taipei	9.7896m/s^2
Nikosia	9.7975m/s^2	Mexico City	9.7860m/s^2	Tokyo	9.7979m/s^2
Djakarta	9.7809m/s^2	Milan	9.8065m/s^2	Vancouver,BC	9.8099m/s^2
Frankfurt	9.8107m/s^2	Mumbai	9.7856m/s^2	Washinton DC	9.8007m/s^2
Glasgow	9.8155m/s^2	New Delhi	9.7922m/s^2	Wellington	9.8028m/s^2
Istanbul	9.8026m/s^2	New York	9.8021m/s^2	Zurich	9.8082m/s^2

※ If the area of the calibration location is not in the table, set the gravitational acceleration of the area closest in latitude.

However, the value in the table may be different from the actual value depending on the longitude and altitude.

If accuracy is required, re-calibration in the area of use is recommended.

4-4-8. 1/4 Scale division (Setting mode 3-5)

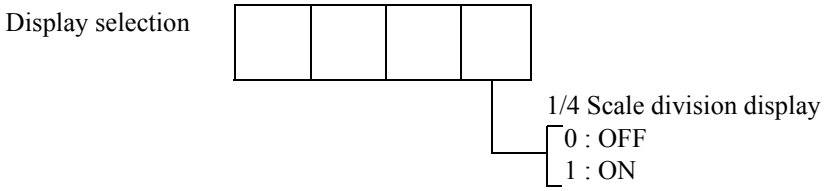
It divides the minimum scale division into four (4) parts. The " CZ ● " (center zero) lamp turns on when the weight is between +1/4 division and -1/4 division.

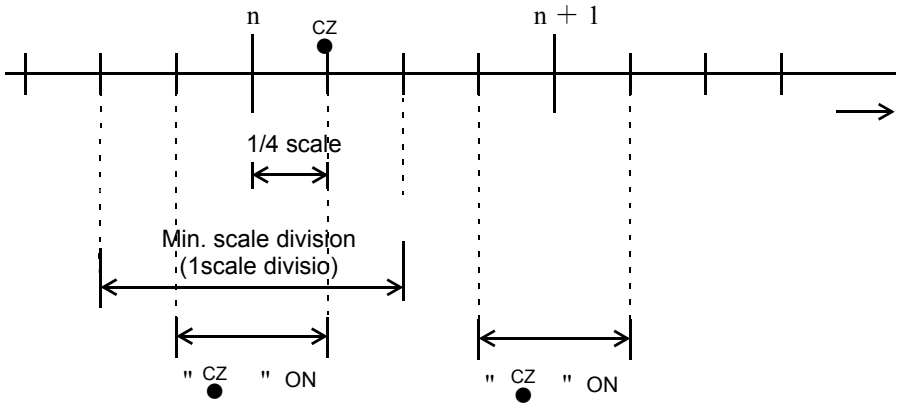
1/4 scale division selects ON/OFF.

Operation

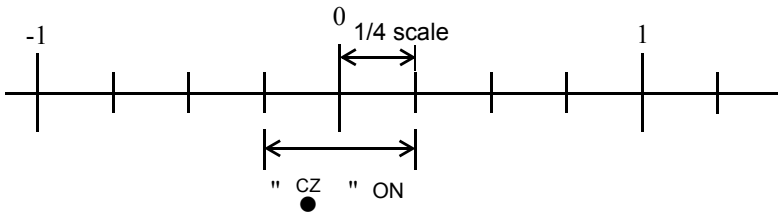
1) Select setting mode 3-5(Display selection).

2) Select 1/4 scale division display ON/OFF.





When the 1/4 scale division setting is OFF, " CZ ● " lamp only works at the zero point.



4-5. Zero calibration (Setting mode 3-8)

Register initial zero point.

・Verify there are no excess loads applied to load cell (or scale).

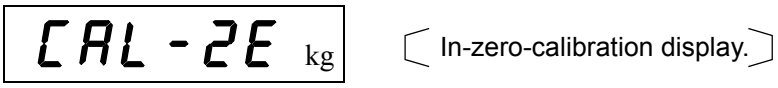
・Check that " STAB ● " is ON.
(Correct calibration can not be completed if signal is unstable.)

Operation

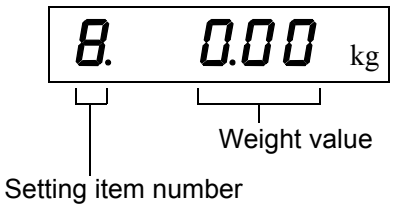
1) Select setting mode 3-8(Zero calibration).

2) Register the Zero point.

Press the PRINT key twice.



3) When the weight value display becomes 0, Zero Calibration is completed.



If a calibration error is displayed, redo Zero Calibration corresponding to the following error messages. (Please refer to"9.OVER SCALE & ERROR" on page 93.)

・" c Err2 "

Do zero calibration again.

Initial dead load is above zero adjustment range.

Remove any excess load from load cell or scale. If c Err2 is still displayed, connect a resistor between +EXC and -SIG load cell connections. This should shift the zero point.

- This table is for a 350 Ω load cell.
- The temperature coefficient of the connected resistor directly influences the accuracy of the indicator. Use a resistance having a temperature coefficient of 50ppm/℃ or more (recommended value of about 5ppm to 10ppm / ℃).

Resistance		Strain	
Calculated value	Approx.value	μ -STRAIN	mV/V
875 KΩ	866 KΩ	200	0.1
437 KΩ	442 KΩ	400	0.2
291 KΩ	294 KΩ	600	0.3
219 KΩ	221 KΩ	800	0.4
175 KΩ	174 KΩ	1000	0.5
146 KΩ	147 KΩ	1200	0.6
125 KΩ	124 KΩ	1400	0.7
109 KΩ	110 KΩ	1600	0.8
97 KΩ	97.6 KΩ	1800	0.9
87.3 KΩ	86.6 KΩ	2000	1.0
79.4 KΩ	78.7 KΩ	2200	1.1
72.7 KΩ	73.2 KΩ	2400	1.2
67.1 KΩ	66.5 KΩ	2600	1.3
62.3 KΩ	61.9 KΩ	2800	1.4
58.2 KΩ	57.6 KΩ	3000	1.5
54.5 KΩ	54.9 KΩ	3200	1.6
51.3 KΩ	51.1 KΩ	3400	1.7
48.4 KΩ	48.7 KΩ	3600	1.8
45.9 KΩ	46.4 KΩ	3800	1.9
43.6 KΩ	43.2 KΩ	4000	2.0
41.5 KΩ	41.2 KΩ	4200	2.1
39.6 KΩ	39.2 KΩ	4400	2.2
37.9 KΩ	38.3 KΩ	4600	2.3
36.3 KΩ	36.5 KΩ	4800	2.4
34.8 KΩ	34.8 KΩ	5000	2.5

- "c Err3"

  Indition dead load is negative.

  Check that load cell is mounted in the correct direction; check that load is being applied to the load cell in the correct direction; check that the +SIG and -SIG lines are propely connected.

  If c Err3 still displayed, connect a resistor between -EXC and -SIG load cell connections. This should shift the zero point. Do Zero Calibration again.

4-6. Span calibration (Setting mode 3-9)

Span calibration means putting a load (test weight) on the load cell (or scale) and calibrating so the F741-C indicates correct weight.

- Put the balance weight value which is set the balance weight value, on the load cell (or scale).
  (Calibrating with more than 50% of the Capacity is favorable in respect of linearity.)
- Verify there are no excess loads applied to load cell (or scale).
- Check that " STAB ● " is on.
  (Correct calibration can not be completed if signal is unstable.)

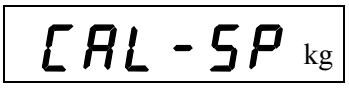
Operation

1) Select setting mode 3-9(Span calibration).

2) Perform span calibration.

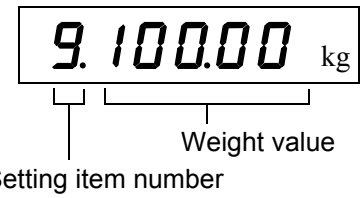
Press the PRINT key to start registration of the balance weight value.

Upon completion of entry, determine it with the PRINT key.



〔 In-span-calibration display. 〕

3) When the weight value display becomes equal to the Balance Weight Value, Span Calibration is completed.



※ If any error message appears, refer to "9.OVER SCALE & ERROR" on page 93.

4-7. Secondary calibration (Equivalent input calibration)(Setting mode 3-7)

By key-inputting the weight value corresponding to the output value (mV/V) of the load cell, calibration is performed so that the input of the entered output value results in the entered weight value display.

Operation

1) Select setting mod 3-7(Equivalent input calibration).

2) Input the output value of the load cell.

Press the PRINT to start registration of the loadcell output value [m/V/V].

Upon completion of entry, determine it with the PRINT key.

※ Set the capacity, min. scale division, balance weight value, gravitational acceleration, etc., before performing equivalent input calibration.

※ If any error message appears, refer to "9.OVER SCALE & ERROR" on page 93.

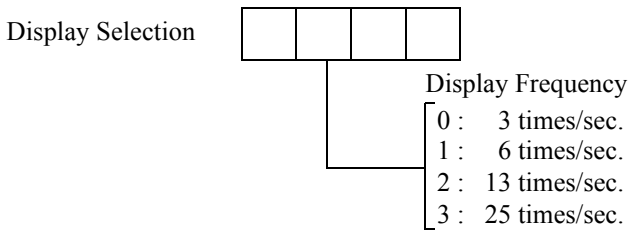
4-8. FUNCTION SETTINGS

4-8-1. Display frequency (Setting mode 3-5)

Select the F741-C display frequency. The numbers of updates on the display per second is only selected here.

Internal A/D conversion speed and CPU processing speed are not changed. The available display frequencies are: 25, 13, 6 or 3 times/sec.. 25 times/sec. is recommended for normal operation.

If the display flickers, select a lower frequency.



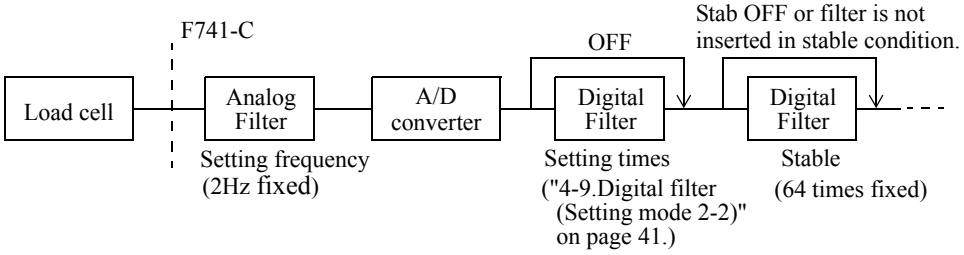
4-9. Digital filter (Setting mode 2-2)

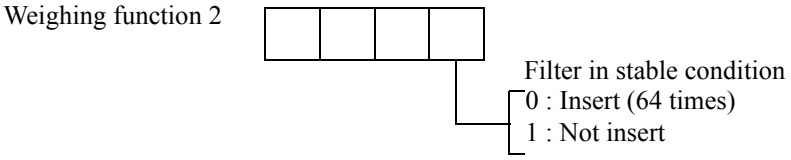
This function minimizes instability of the weight value by calculating the average frequency of the data converted from analog to digital. The frequency of the moving average selected from OFF(1) ~ 128 times. A higher frequency will make a more stable display with slower response.
A lower frequency will have quicker response but more unstable display.
Select the most suitable value for the weighing.

4-10. Filter in stable condition (Setting mode 2-8)

When indicated value is stable, this function automatically insert the Digital Filter for restraining the instability. Select whether inserts it or not.

Regarding the definition of stability, refer to「4-11.Motion Detection (MD)(Setting Mode 2-3,2-4,2-8)」.





4-11. Motion detection(MD) (Setting mode 2-3,2-4,2-8)

Set the parameter to detect the stability of the indicated value.

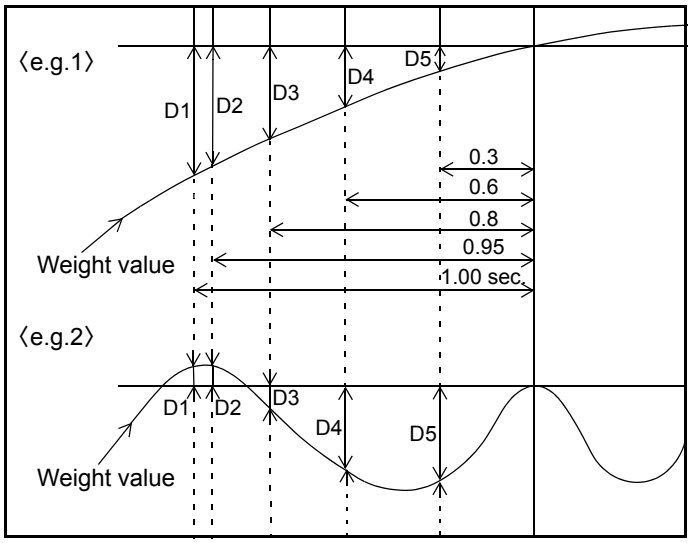
When the range of weight changes is within the set range and the status lasts for set period of time, the Stab. turns ON considering to be the weight stable.

There are stable mode and checker mode in motion detection.

● Stable mode

D1 ~ D5 shown below are compared with a set range at each A/D conversion.

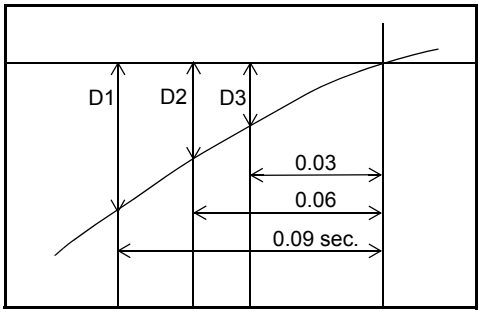
＊ D1 represents the difference between current weight value and the value 1 second previous. If one of them exceeds the range, the Stab. turns OFF at once.



● Checker mode

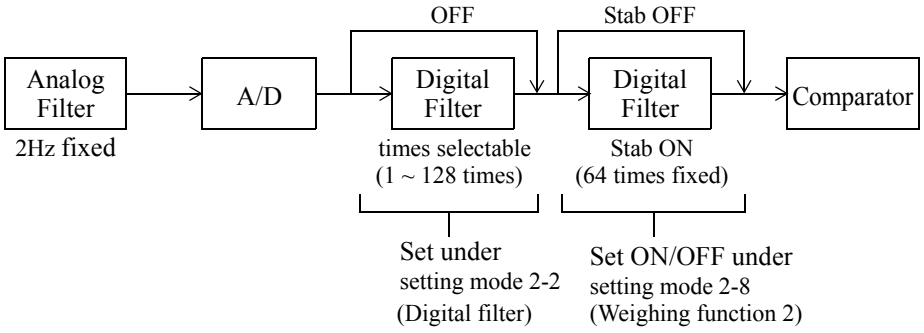
D1 ~ D3 shown below are compared with a set range at each A/D conversion.
If one of them exceeds the range, the Stab. turns OFF at once.

＊ D1 represents the difference between current weight value and the value 0.09 second previous.



When the Stab. is ON, it enables to insert the Digital Filter to restrain the instability of weight value.

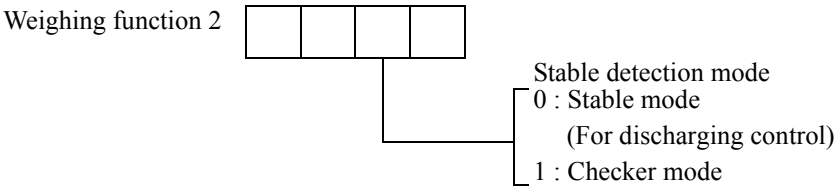
(Please refer to "4-10.Filter in stable condition (Setting mode 2-8)" on page 41.)



● Setting motion detect parameter

・MD mode (Setting mode 2-8)

Select the stable condition from stable mode or checker mode.



・MD period (Setting mode 2-3)

Setting the period for judging the stability of weight.

(Input range / 0.0 ~ 9.9)

・MD range (Setting mode 2-4)

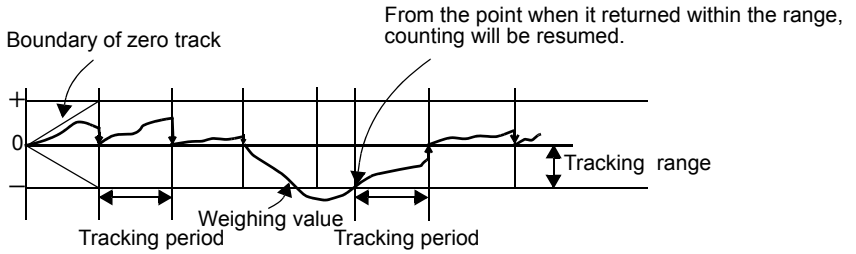
Comparing the value (setting value × minimum scale division) with the range of weight change.

(Input range / 0 ~ 99)

4-12. Zero tracking (ZT)

This function automatically adjusts slow drifts and slight shifting of the zero point due to small amounts of accumulation on a scale.

- Zero tracking adjusts the zero point every set period when the shifting of the zero point is within the set point.
- The tracking period must be set between 0.0 and 9.9 seconds. The tracking range (digit) must be set from 0 ~ 9999 using a 1/4 scale division as a unit. (0002=0.5 divisions, 0012=3 divisions)
  Zero tracking does not work when the period is set 0.0 or the range is set to 00.



a) Zero tracking period (Setting mode 2-5) Input range / 0.0 ~ 9.9

b) Zero tracking range (Setting mode 2-6) Input range / 0 ~ 9999

4-13. Digital zero (DZ)

However, gross weight exceeding the DZ regulation value cannot be zeroed.

Operation

1) Press the ZERO key once.

2) Gross is zeroed.

If digital zero operation is performed when gross weight > DZ regulation value, gross weight from which the DZ regulation value is subtracted is displayed. At the same time, " ZALM " flashes to give an alarm of the problem.

In such a case, take the following measures.

Measure
Change the set value of the DZ regulation value and perform digital zero operation again. (However, since this is a temporary measure, perform zero calibration at an early time.)
Remove lightweight residue adhered to the tank.
Check that there is no mechanical contact.

4-14. Digital zero clear

Zero point correction by digital zero operation is cleared by this function.
By performing this operation, the zero point returns to the state in which zero calibration was registered. Also, " ZALM ", if flashing, goes out.

Operation

1) Press the PRINT key while pressing the ZERO key.

2) Zero point correction is cleared.

4-15. Zero regulation value (Setting mode 3-4)

Set a range of zero point adjustment (a gap from the registered zero calibration value) by digital zero or zero tracking.
If the digital zero operation is performed or zero tracking operates where the DZ regulation value is exceeded, " ZALM " flashes to give a warning of the problem.

(Input range / 0 ~ 9999)

4-16. Gross weight display/net weight display

On the F741-C, gross weight or net weight can be selected and displayed. Switch between gross weight display and net weight display with the GROSS/NET key. Each time the GROSS/NET key is pressed, it alternately switches between gross weight display and net weight display. When gross weight is displayed, " NET " goes out, and when net weight is displayed, " NET " lights.

Net weight is expressed as Gross weight - Tare weight.

Tare weight is determined by tare subtraction. Tare subtraction includes one-touch tare subtraction and digital tare subtraction.

※ For one-touch tare subtraction, see 4-17. One-touch tare subtraction (TARE).

※ For digital tare subtraction, see "4-19.Digital tare subtraction" on page 47.

4-17. One-touch tare subtraction (TARE)

Tare is subtracted and net weight is zeroed by pressing [TARE] key.

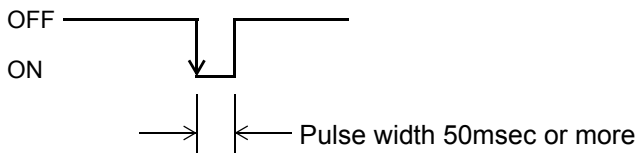
Operation

1) Press the [TARE] key.

2) One-touch tare subtraction is completed, and " TARE ● " lights.

● Tare subtraction by external input signal

By short-circuiting the external input signal TARE (TARE ON) and COM, net weight is immediately zeroed, and " TARE ● " lights.



※ If Net weight is not zeroed by performing the operation of Tare subtraction, the following causes are presumable.Take the following measures.

Cause	Measure
Gross weight is displayed.	Press the [GROSS NET] key to display net weight. (If " NET ● " is lit, net weight is displayed.)

4-18. One-touch tare subtraction reset

Tare subtraction is reset by this function. By performing this operation, the tare weight by one-touch tare subtraction operation can be cleared.

Operation

1) Press the PRINT key while pressing the TARE key.

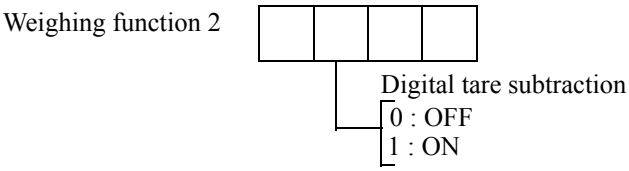
2) Tare subtraction is reset.

4-19. Digital tare subtraction

Tare is subtracted and net weight is zeroed.

By setting a tare value and turning ON the selection of tare subtraction, digital tare subtraction can be executed.

a) Digital tare subtraction (Setting mode 2-8) (Select from 0 : OFF / 1 : ON)



b) Tare setting (Input range / 0 ~ 99999)

The value of more than Capacity or less than Min. Scale division cannot be inputted.

The tare setting item No. differs according to the setting state of the comparison mode.

When the comparison mode is set to

- Upper/Lower limit comparison mode: Set in setting mode 1-5.
- Over/Under comparison mode: Set in setting mode 1-6.
- Discharging control mode: Set in setting mode 1-8.

One-touch tare subtraction and digital tare subtraction function independently. Even when digital tare subtraction is ON, if the TARE key is pressed, tare subtraction is immediately performed and net weight is zeroed.

4-20. Tare weight display

Current tare weight is displayed by this function. The tare weight displayed here is a result with both one-touch tare subtraction and digital tare subtraction taken into consideration.

The display method differs according to the setting state of the comparison mode.

When the comparison mode is set to

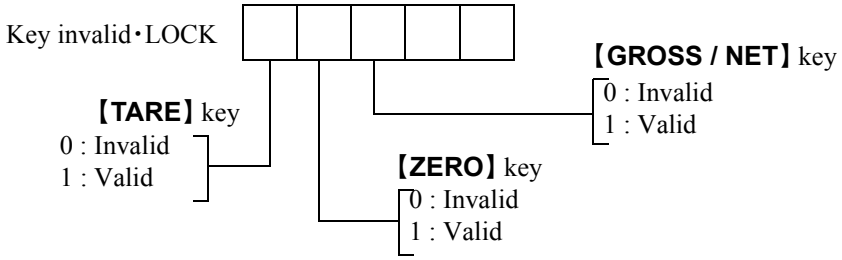
- Upper/Lower limit comparison mode: Set in setting mode 1-6.
- Over/Under comparison mode: Set in setting mode 1-7.
- Discharging control mode: Set in setting mode 1-9.

- If the tare weight is 0, "TARE" goes out.
- If the tare weight is not 0, "TARE" lights.
- If (tare weight by one-touch tare subtraction) - (tare weight by digital tare subtraction) = 0, "TARE" goes out.

4-21. Validation of function keys (Setting mode 2-9)

Function keys on the front panel can be validated to prevent malfunctioning due to key operation.

a)【TARE】key (Select from 0:Invalid / 1:Valid)
b)【ZERO】key (Select from 0:Invalid / 1:Valid)
c)【GROSS / NET】key (Select from 0:Invalid / 1:Valid)



5. WEIGHING SETTING AND OPERATION

5-1. Comparison mode (Setting mode 2-7 Weighing function 1)

On the F741-C, three weighing methods can be selected by comparison mode.

Select from three comparison modes.

Weighing function 1 [ ][ ][ ][ ][ ]

Comparison mode
- 0 : Upper/Lower limit comparison mode
- 1 : Over/Under comparison mode
- 2 : Discharging control mode

5-2. Near zero comparison

This function is to detect that weight values are near zero.

Near zero can be set as desired. Comparison condition depends on the near zero comparison mode.

a) Near zero Input range / 0 ~ 99999

The near zero setting item No. differs according to the setting state of the comparison mode.

When the comparison mode is set to

- Upper/Lower limit comparison mode: Set in setting mode 1-4.
- Over/Under comparison mode: Set in setting mode 1-5.
- Discharging control mode: Set in setting mode 1-7.

b) Near zero comparison mode (Weighing function 1 in setting mode 2-7)

Select near zero comparison condition.

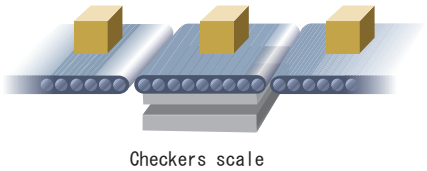
Weighing function 1 [ ][ ][ ][ ][ ]

Near zeroc omparison mode
- 0 : Near zero signal ON when gross weight ≦ near zero setting value
- 1 : Near zero signal ON when net weight ≦ near zero setting value
- 2 : Near zero signal ON when |gross weight| ≦ near zero setting value
- 3 : Near zero signal ON when |net weight| ≦ near zero setting value
- 4 : Comparison OFF

※ When the near zero signal is ON, " NZ ● " lights.

5-3. Upper/Lower limit comparison mode

The upper limit and lower limit are set, with respect to each of which weight values are compared in this mode.
This is convenient to simple checkers.


Checkers scale

5-3-1. Upper/Lower limit comparison mode

Set the upper limit and lower limit as desired, and set the weight to be compared by comparison weight value. Also, set the comparison timing accordingly.

a) Upper limit (Setting mode 1-1),Lower limit (Setting mode 1-2)

Input range / 0 ~ 99999

b) Comparison weight value (Setting mode 2-7 Weighing function 1)

Determine the weight to be compared with the upper limit and lower limit.

Weighing function 1 | | | | | |

Comparison weight value
0 : Gross
1 : Net
2 : Comparison OFF

※ If "Comparison OFF" is selected, control outputs (HI, GO, LO) are not made.

c) Comparison condition

In upper/lower limit comparison mode, control outputs (HI, GO, LO) are made under the following conditions:

・HI output (HI ● lights):

Turns ON when the weight value > upper limit setting value

・GO output (GO ● lights):

Turns ON when the lower limit setting value ≦ weight value ≦ upper limit setting value

・LO output (LO ● lights):

Turns ON when the weight value < lower limit setting value

d) Comparison timing (Setting mode 2-7 Weighing function 1)

Determine the timing of comparison with the upper limit and lower limit.

Weighing function 1 [ ][ ][ ][ ][ ]

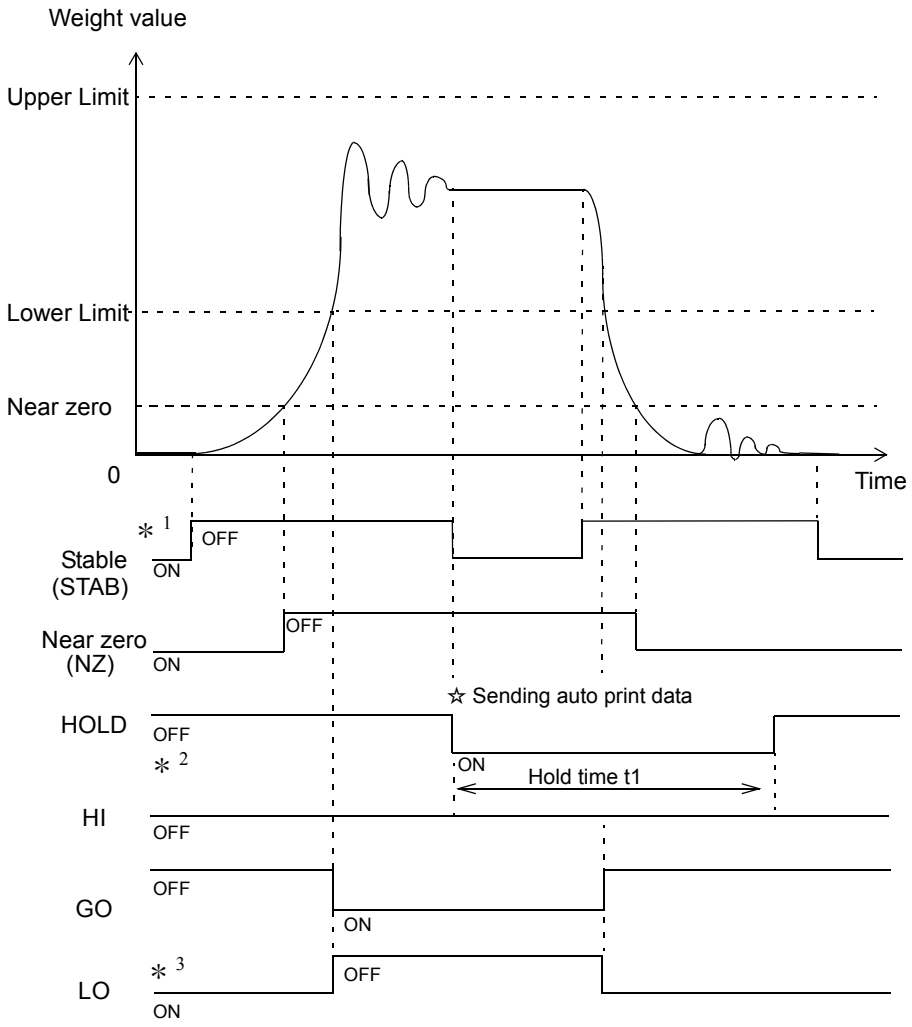
Comparison timing
0 : Compare regularly
1 : Compare in a stable condition.
2 : Compare regularly except near zero.
3 : Compare in a stable condition except near zero.

※ If "Compare in a stable condition" is selected, comparison is made only in a stable condition (while " STAB ● " is lit).

※ Determine whether near zero is ON or OFF by near zero comparison mode.

Also, "except near zero" indicates a state in which " NZ ○ " is unlit.

e) Time chart in upper/lower limit comparison mode



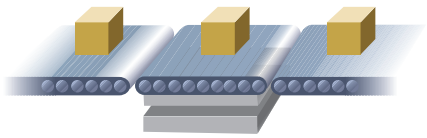
＊[1] : Determine the stable condition by stable detection mode (weighing function 2 in setting mode 2-8) and motion detection (setting mode 2-3 and 2-4).

＊[2] : To hold weight values, there is a need to set the auto print mode (weighing function 1 in setting mode 2-7) to 2 (auto print ON, weight value hold) in advance.
Determine hold time t1 by setting mode 1-3 (input range: 0.0 - 9.9 sec).
Also, to perform auto print, there is a need to set the auto print mode to auto print ON and also the communication mode (RS-232C I/F setting in setting mode 4-1) to 5 - 7 (communication mode 4 - 6).
In upper/lower limit comparison mode, auto print data is sent at the time of change from a non-stable to a stable state beyond near zero.

＊[3] : Control outputs are described as an example in which the comparison timing is set to compare regularly.

5-4. Over/Under comparison mode

Over and Under based on the target value are set, with respect to each of which weight values are compared in this mode.
This is convenient to simple checkers.



Checkers scale

5-4-1. Over/Under comparison mode

Set Target, Over, and Under as desired, and set the weight to be compared by comparison weight value.
Also, set the comparison timing accordingly.

a) Target value (Setting mode 1-1)

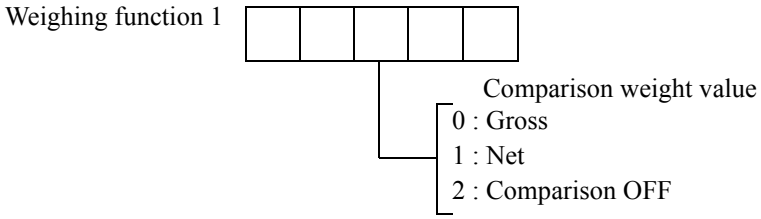
Input range / 0 ~ 99999

b) Over (Setting mode 1-2), Under (Setting mode 1-3)

Input range / 0 ~ 9999

c) Comparison weight value (Setting mode 2-7 Weighing function 1)

Determine the weight to be compared with (target value + over) and (target value - under)



※ If "Comparison OFF" is selected, control outputs (HI, GO, LO) are not made.

d) Comparison condition

In over/under comparison mode, control outputs (HI, GO, LO) are made under the following conditions:

・HI output (HI ● lights):

Turns ON when the weight value > (target value + over)

・GO output (GO ● lights):

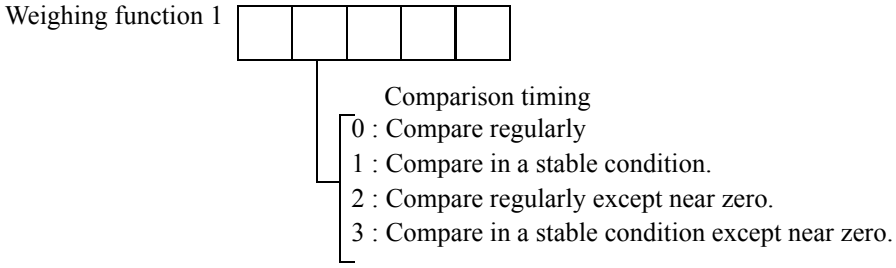
Turns ON when (target value - under) ≦ weight value ≦ (target value + over)

・LO output (LO ● lights):

Turns ON when the weight value < (target value - under)

e) Comparison timing (Setting mode 2-7 Weighing function 1)

Determine the timing of comparison with (target value - under) and (target value + over).

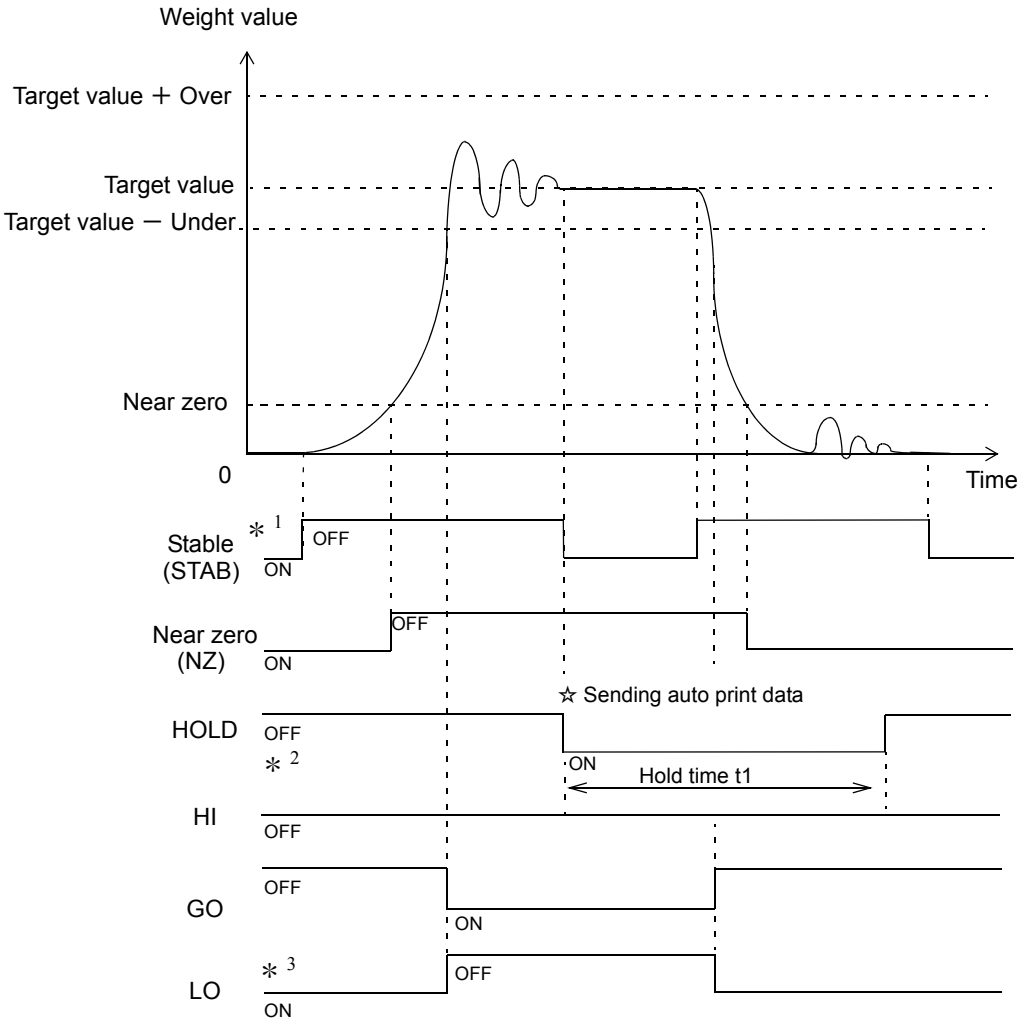


※ If "Compare in a stable condition" is selected, comparison is made only while " STAB ● " is lit (in a stable condition).

※ Determine whether near zero is ON or OFF by near zero comparison mode.

Also, "except near zero" indicates a state in which " NZ ○ " is unlit.

f) Time chart in Over/Under comparison mode



＊1 : Determine the stable condition by stable detection mode (weighing function 2 in setting mode 2-8) and motion detection (setting mode 2-3 and 2-4).

＊2 : To hold weight values, there is a need to set the auto print mode (weighing function 1 in setting mode 2-7) to 2 (auto print ON, weight value hold) in advance.
Determine hold time t1 by setting mode 1-4 (input range: 0.0 - 9.9 sec).
Also, to perform auto print, there is a need to set the auto print mode to auto print ON and also the communication mode (RS-232C I/F setting in setting mode 4-1) to 5 - 7 (communication mode 4 - 6).
In over/under comparison mode, auto print data is sent at the time of change from a non-stable to a stable state beyond near zero.

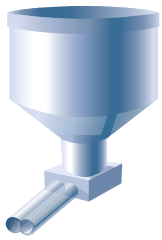
＊3 : Control outputs are described as an example in which the comparison timing is set to compare regularly.

5-5. Discharging control mode

A fixed amount is accurately discharged from a tank like a hopper in this mode.

In this mode, after completion of the previous weighing, when the weight drops below 25% of the fixed amount, the state is judged as the next weighing is possible.

If the start of weighing cannot be judged, the COMPLETE signal cannot also be output.



Hopper scale

Also, the HI, GO, and LO output signals cannot be used.

For use of this mode, affix the attached label to the front panel and rear panel to use as COMPL (COMPLETE), SP2, and SP1.

5-5-1. Discharging control

Set Final, Compensation, and Set point 1 as desired. Set the weight to be compared by comparison weight value.

Also, set the comparison timing accordingly.

a) Final (Setting mode 1-1), Set point 1 (Setting mode 1-3)

Input range / 0 ~ 99999

b) Compensation (Setting mode 1-2)

Input range / 0 ~ 9999

c) Comparison weight value (Setting mode 2-7 Weighing function 1)

Determine the weight to be compared with (final - compensation) and (final - Set point 1).

Weighing function 1 | | | | | |

Comparison weight value
0 : Gross
1 : Net
2 : Comparison OFF

※ If "2 : Comparison OFF" is selected, control outputs (COMPL, SP2, SP1) are not made.

d) Comparison condition

In discharging control mode, control outputs (COMPL, SP2, SP1) are made under the following conditions:

・COMPL output (COMPL ● lights):

Turns ON while the COMPLETE signal is output

・SP2 output (SP2 ● lights):

Turns ON when the weight value ≧ (final - compensation)

・SP1 output (SP1 ● lights):

Turns ON when the weight value ≧ (final - set point 1)

※ If Set point 1 = 0, the SP1 signal is not output constantly.

※ If SP1 is not used, Set point 1 should be set at 0.

e) Comparison inhibit time (Setting mode 1-4)

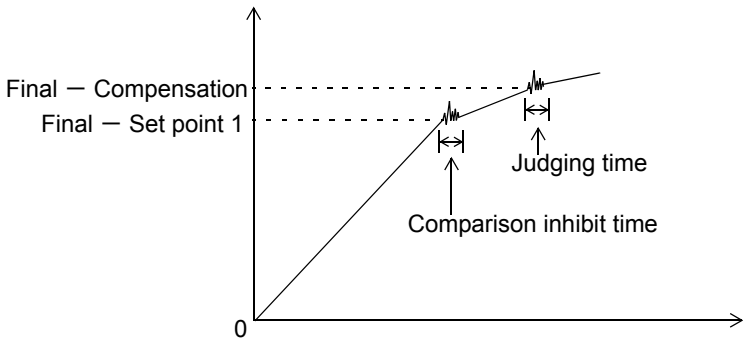
Input range / 0.00 ~ 9.99 【Second】

In discharging control mode, comparison can be inhibited for a fixed time to prevent inappropriate control operation by mechanical vibrations associated with valve opening and closing.

Comparison inhibit time works from when the weight value reaches (final - set point 1).

f) Judging time (Setting mode 1-5) Input range / 0.0 ~ 9.9 【Second】

In a manner similar to comparison inhibit time, comparison judgment is inhibited for a fixed time to prevent inappropriate judgment by mechanical vibrations associated with valve opening and closing. Judging time works from when the weight value reaches (final - compensation).



g) Comparison timing (Setting mode 2-7 Weighing function 1)

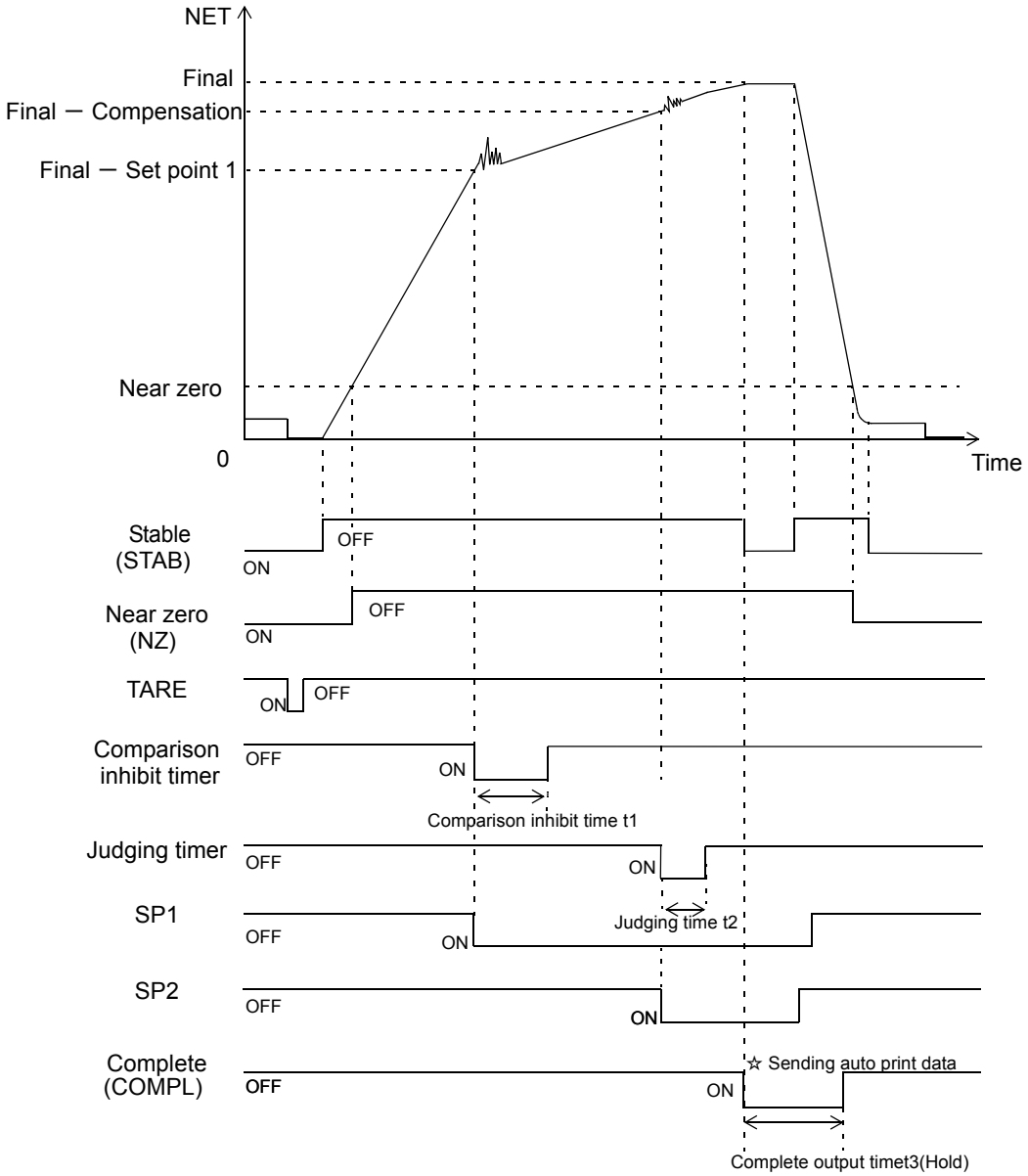
Determine the timing of comparison with (final - compensation) and (final - set point 1).

Weighing function 1 [ ][ ][ ][ ][ ]

Comparison timing
- 0 : ON from when the judging timer has elapsed.
- 1 : ON from when stable condition is established after the judging timer has elapsed.
- 2 : ON from when the judging timer has elapsed or from when stable condition is established.

※ Stable condition indicates a state in which " STAB ● " is lit (stable state).

h) Time chart in discharging control mode



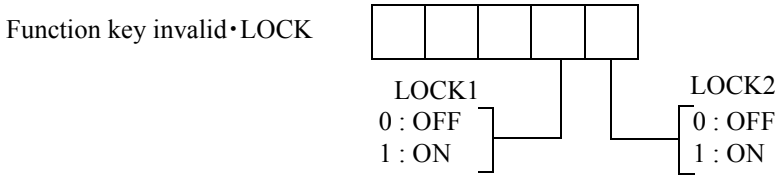
＊[1]: Determine the stable condition by stable detection mode (weighing function 2 in setting mode 2-8) and motion detection (setting mode 2-3 and 2-4).

＊[2]: To hold weight values, there is a need to set the auto print mode (weighing function 1 in setting mode 2-7) to 2 (auto print ON, weight value hold) in advance.
In discharging control mode, weight values are held for the complete output time only under the above conditions. Determine complete output time t3 by setting mode 1-6 (input range: 0.0 - 9.9 sec).
Also, to perform auto print, there is a need to set the auto print mode to auto print ON and also the communication mode (RS-232C I/F setting in setting mode 4-1) to 5 - 7 (communication mode 4 - 6).
Auto print data is sent at the time of start of the COMPLETE signal output.

6. SYSTEM MODE

6-1. LOCK(soft)

Lock for protecting from false operation, refer to "16.THE LIST OF INITIAL SETTING VALUE" on P.111 regarding effective setting value for LOCK (soft).
Select from ON/OFF.



6-2. PASSWORD

For future extension puropose only. Normally, it is not used.

6-3. Self-check

This equipment is provided with the self-check function by which the memory is automatically checked to detect problems, and the visual check function by which the display can be checked visually.

While pressing the PRINT key, turn ON the power.With this, checking starts immediately.

	Description	Type
1	Software version	Display
2	Check sum	Display
3	ROM Check sum Check	
4	All lighting on the display	Display
5	Status sequential lighting	Visual
6	7-segment lighting on the display	Visual
7	NOV RAM Read/Write Check	Auto
8	PASS display and check end	Display

2 Digit
←Add. 05
←AddErr is displayed when error occurs.

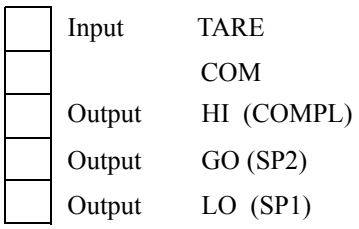
←nouErr is displayed when error occurs.

※ The software version display may vary according to the time of purchase.
※ When the LOCK switch on the rear panel is ON, the NOV RAM is not checked.
※ Visually check the display.
※ Checking stops when there is any problem during memory checks.
※ If checking in progress stops or the display is not correct, it is faulty. Ask our agency or us for repair.

7. EXTERNAL INPUT/OUTPUT SIGNALS (CONTROL CONNECTOR)

The Input/Output circuit and internal circuit are photocoupler-insulated electrically.

7-1. Control connector-pin assignment

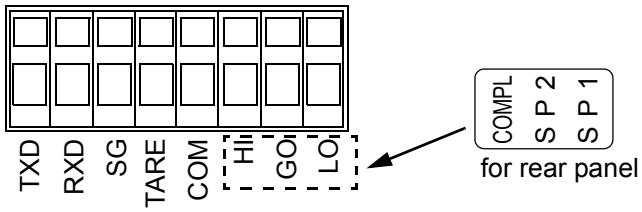


Input	TARE
	COM
Output	HI (COMPL)
Output	GO (SP2)
Output	LO (SP1)

※ COM and SG are isolated electrically.

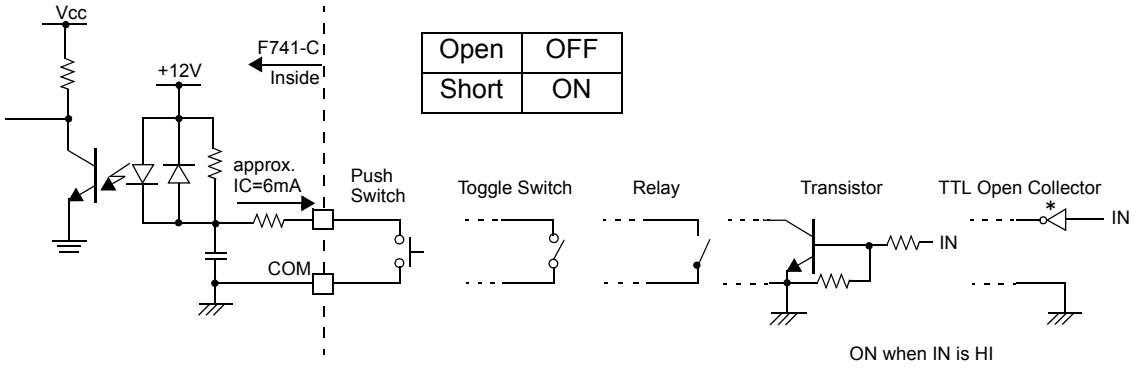
※ The power supply voltage is not output externally.

※ For use in comparison mode 2 (discharging control mode), affix the attached "COMPL/SP2/SP1" label to "HI/GO/LO" on the rear panel.



7-2. Equivalent circuit (Input)

A signal is inputted to the signal input circuit by short-circuiting or opening the input terminal and the COM terminal. Short-circuiting is effected by means of a contact (such as a relay or a switch) or a noncontact (such as a transistor or an open-collector TTL).

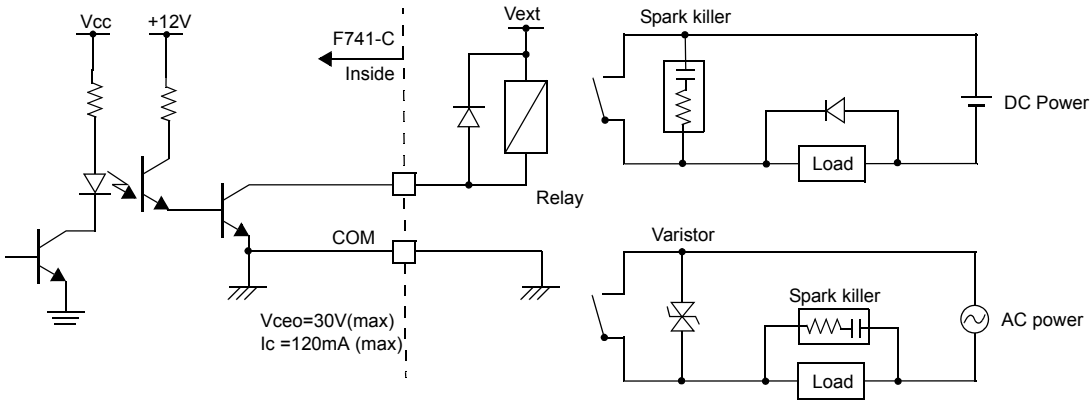


Open	OFF
Short	ON

- Do not apply external voltage to the signal input circuit.
- The external element is required to withstand Ic=10mA.
- Leakage from the external element is required to be 100 μA or below.

7-3. Equivalent circuit (Output)

The signal output circuit is open-collecter output of a transistor.



・Transistor status

Output data	Tr
0	OFF
1	ON

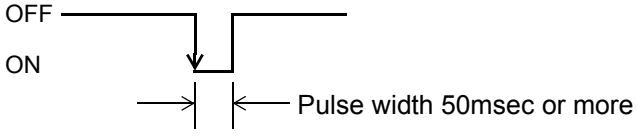
- ・Use external power source (up to DC30V) for driving relay (Vext).
- ・Do not short-circuit the load, such as a coil of relay, that will break the output transistor.
- ・Connect a surge absorber or a speark killer to the relay circuit as shown in the draft so that to reduce noise trouble and extend the life of relay.
  Noise trouble can be reduced, and the relay's life can be extended.

7-4. External input signal

7-4-1. Tare (Tare ON) ＜ Edge input ＞

Subtract the tare at once by external input ON edge (OFF → ON), it brings the net weight to zero.

The TARE key operation also results in the same movement (only when the [TARE] key is set at 1: valid in setting mode 2-9).



7-5. External output signal

The meanings of the external output signals differ according to the state of the comparison mode.

Determine the comparison mode by weighing function 1 (setting mode 2-7).

7-5-1. When comparison mode 0 (Upper/Lower limit comparison mode) is set

● HI,GO,LO

Respective output signals turn ON under the following

・HI : Weight value ＞ Upper LimitSetting value

・GO : Lower Limit Setting value ≦ Weight value ≦ Upper Limit Setting value

・LO :Weight value ＜ Lower LimitSetting value

7-5-2. When comparison mode 1 (Over/Under comparison mode) is set

● Respective output signals turn ON under the following conditions.

・HI : Weight value ＞ (Target value ＋ Over)

・GO : (Target value － Under) ≦ Weight value ≦ (Target value ＋ Over)

・LO : Weight value ＜ (Target value － Under)

7-5-3. When comparison mode 2 (Discharging control mode) is set

※ Use the output signals not as HI, GO, and LO, but as COMPL (COMPLETE), SP2, and SP1.

● COMPL,SP2,SP1

Respective output signals turn ON under the following conditions.

・COMPL : While the COMPLETE signal is output

・SP2 : Weight value ≧ Final － Compensation

・SP1 : Weight value ≧ Final － Set point 1

・If Set point 1 = 0, the SP1 signal is not output constantly.

・Determine the COMPLETE signal output timing by weighing function 1 (setting mode 2-7).

・After output of the COMPLETE signal, only when the weight once drops below 25% of the fixed amount, it is judged that the next weighing can be started. If the start of weighing cannot be judged, the COMPLETE signal cannot also be output.

8. INTERFACE

8-1. RS-232C Interface［232］

8-1-1. Communication specifications

1.Specifications

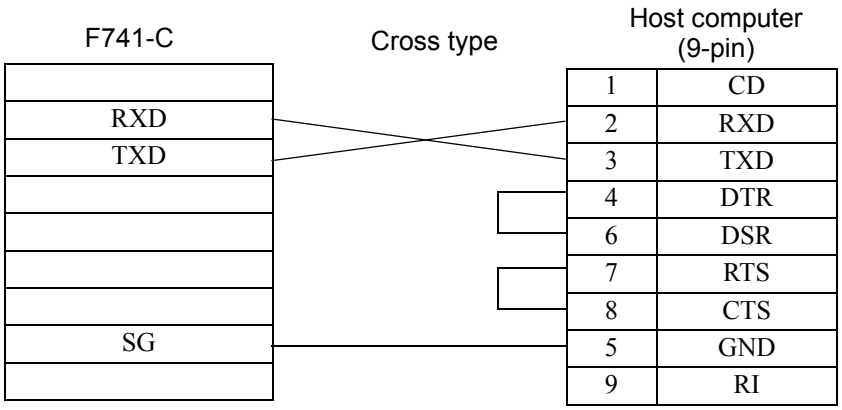
Signal level	:	Based on the RS-232C
Transmitting distance	:	Approx. 15m
Transmitting method	:	Asynchronous, full duplex
Transmitting speed	:	1200, 2400, 4800, 9600, 19200 or 38400 bps selectable
Bit configuration	:	Start 1 bit
		Character length 7 or 8 bits selectable
		Stop 1 or 2 bits selectable
		Parity none, odd or even selectable
Code	:	ASCII

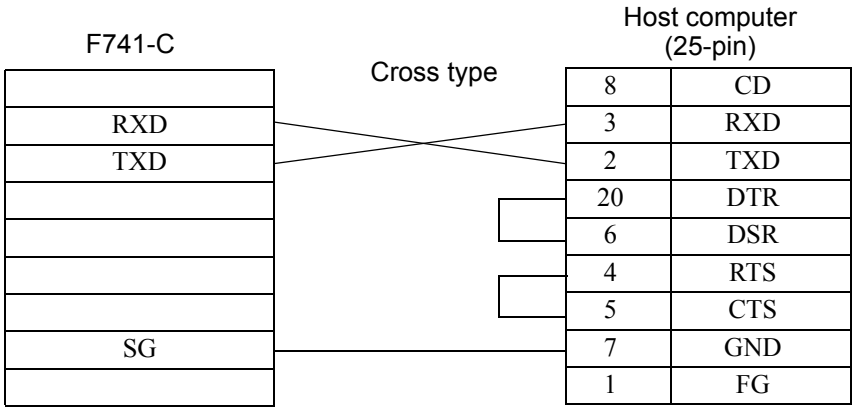
2.Connector pin assignment

RS-232C connector

TXD	Transmitted Data
RXD	Received Data
SG	Signal Ground

8-1-2. Cable





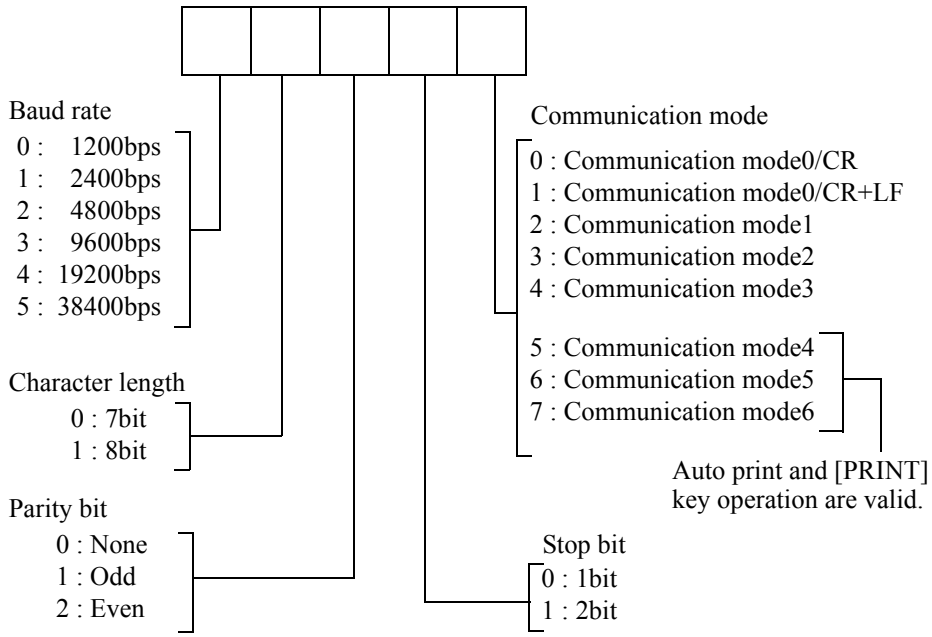
The above diagram is for connecting a host computer as a DTE (Data Terminal Equipment) device. If it is a DCE (Data Circuit-terminating Equipment) device, connect pin to pin (DTR to DTR, DSR to DSR etc.).

Cables should be prepared after checking connector type and pin assignments of the connected device.

8-1-3. Setting values for RS-232C

1.Set the RS-232C port of this equipment.

RS-232C I/F (Setting Mode 4-1)



2. The initial set for RS-232C port of connecting personal computer and sequencer should be the same setting of F741-C.

8-1-4. Communication mode

· Communication mode0

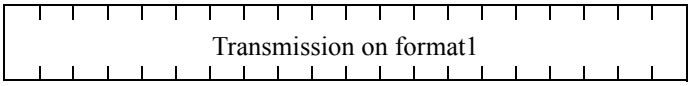
F741-C communicates with the command from the host computer.

The terminator can be selected “CR” or “CR+LF”.

· Communication mode1

F741-C sends Gross weight continuously.

R,W,C,command is invalid at this mode.

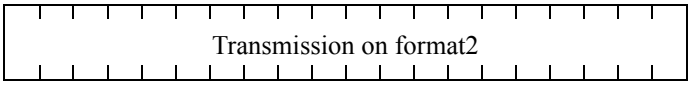


(22byte)

· Communication mode2

F741-C sends net weight continuously.

R,W,C,command is invalid at this mode.

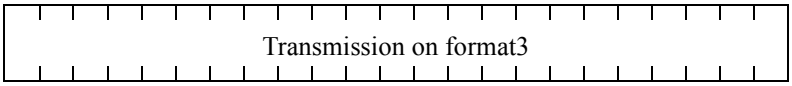


(22byte)

· Communication mode3

F741-C sends gross weight and net weight continuously.

R,W,C,command is invalid at this mode.

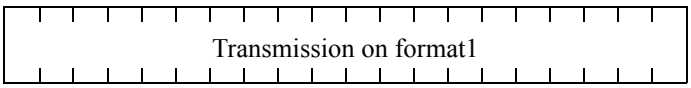


(24byte)

· Communication mode4

The gross weight is sent once at auto-print time or when the PRINT key is pressed.

R,W,C,command is invalid at this mode.

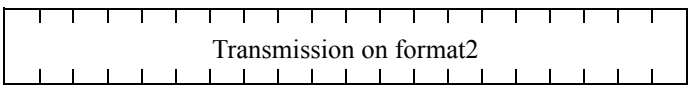


(22byte)

· Communication mode5

The net weight is sent once at auto-print time or when the PRINT key is pressed.

R,W,C,command is invalid at this mode.

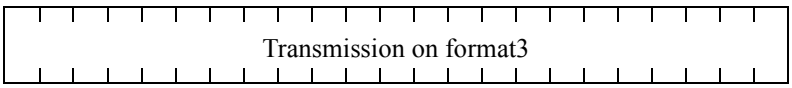


(22byte)

・Communication mode6

The gross weight and net weight are sent once at auto-print time or when the PRINT key is pressed.

R,W,C,command is invalid at this mode.



(24byte)

Request

For the Transmission on format, see "8-1-5.Transmission on format" on page 67.
For the auto print function, see "8-1-8.About the auto print function" on page 73.

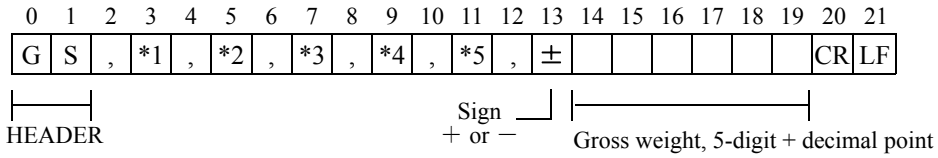
About the timing of continuous sending

The continuous sending interval in the case where any of communication modes 1 to 3 is selected is as shown below according to the status of the communication baud rate setting.

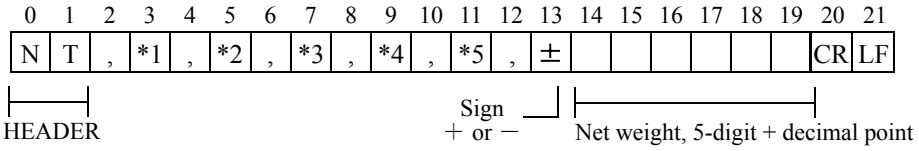
Communication baud rate	Continuous sending interval
38400 bps	100 times/sec.
19200 bps	50 times/sec.
9600 bps	25 times/sec.
4800 bps	12 times/sec.
2400 bps	6 times/sec.
1200 bps	3 times/sec.

8-1-5. Transmission on format

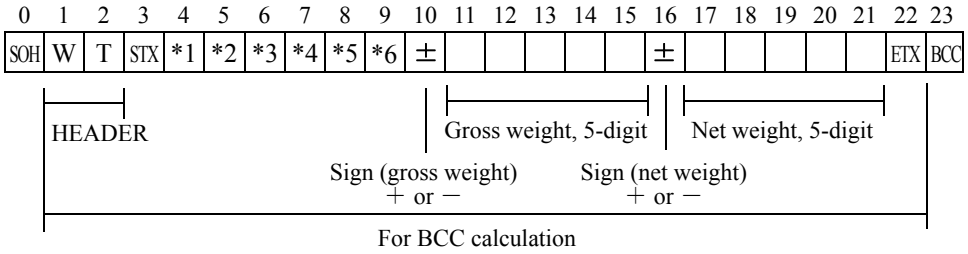
· Transmission on format1



· Transmission on format2



· Transmission on format3



Each ASCII code of SOH,STX and ETX

SOH : 01 STX : 02 ETX : 03

BCC : Block check character

It is calculated as the XOR of the transmitted character (Hexadecimal).

*1 O : Overload (LOAD,OFL)
S : Stable
M : Unstable
H : Hold

Priority : H > O > (S or M)

*2 A : Zero tracking OFF
T : Zero tracking ON
Z : Zero error (ZARM)

Priority : Z > (A or T)

*3 Upper/lower limit comparison and over/under comparison modes

H : Upper limit/Over ON
L : Lower limit/Under ON
G : Upper limit/Over and Lower limit/Under OFF
N : Upper limit/Over and Lower limit/Under ON
F : Comparison OFF

Priority : N > (H or L), F > G

Discharging control Mode

0 : Set point 1,Final,Complete OFF
1 : Set point 1 ON
2 : Final ON
C : Complete ON
F : Comparison OFF

Priority : C > 2 > 1, F > 0

*4 N : Near zero OFF
Z : Near zero ON

*5 Unit

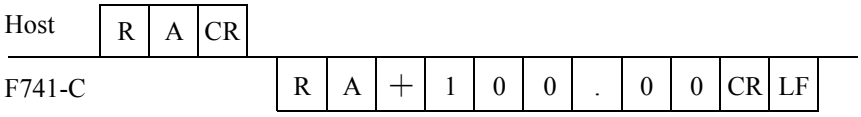
0 : None 5 : N
1 : t 6 : oz
2 : g 7 : kN
3 : kg
4 : lb

*6 Decimal place

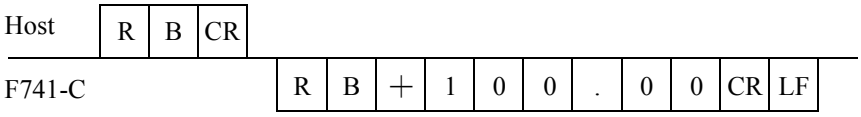
0 : 0
1 : 0.0
2 : 0.00
3 : 0.000

8-1-6. Communication format

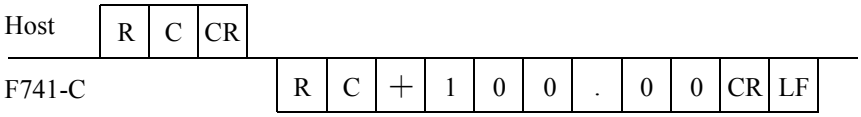
・Reading out the gross weight (sign, 5-digt weight value, decimal point)



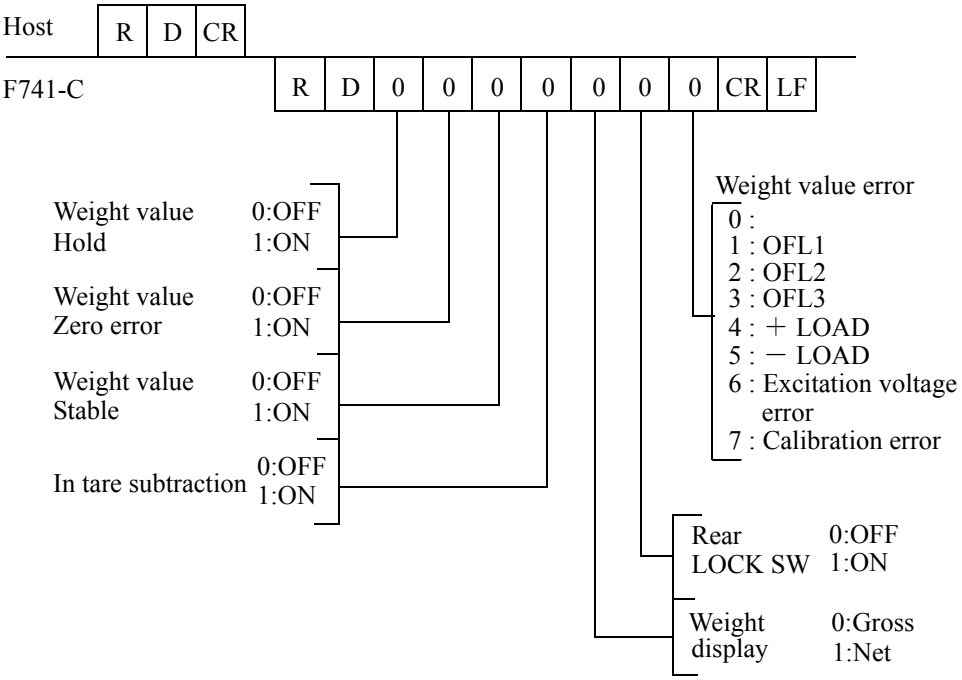
・Reading out the net weight (sign, 5-digit weight value, decimal point))



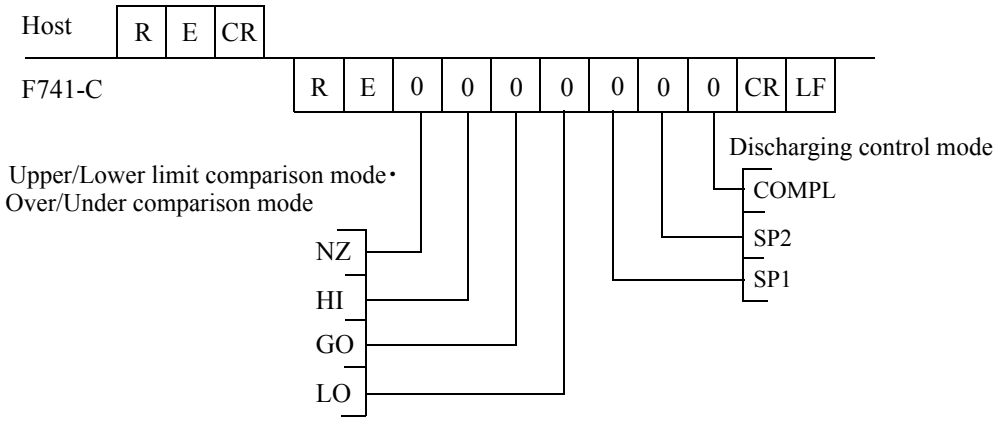
・Reading out the tare weight (sign, 5-digit weight value, decimal point)



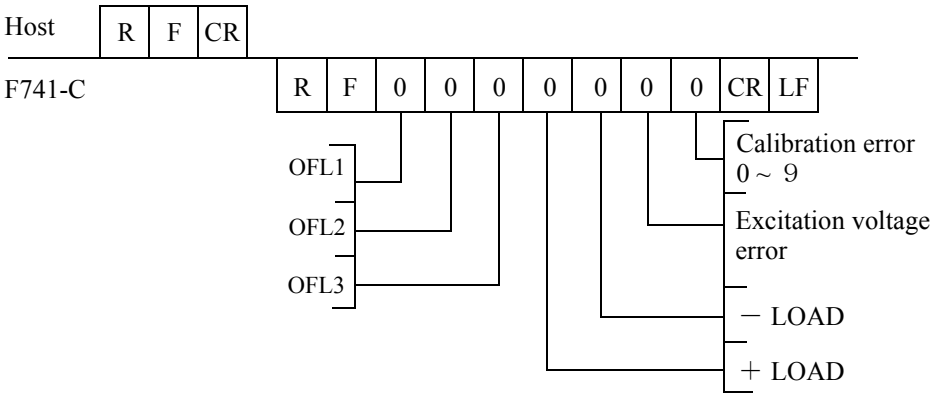
・Reading out the status 1(7-digit)



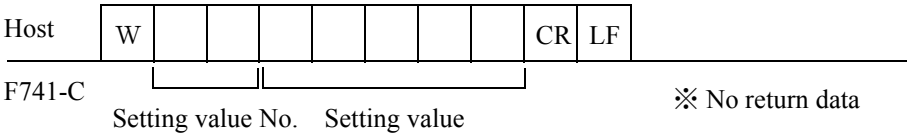
・Reading out the status 2 (7-digit)



・Reading out the status 3 (7-digit)

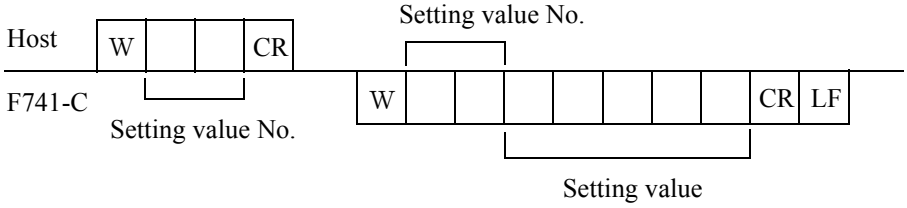


・Write in the set value



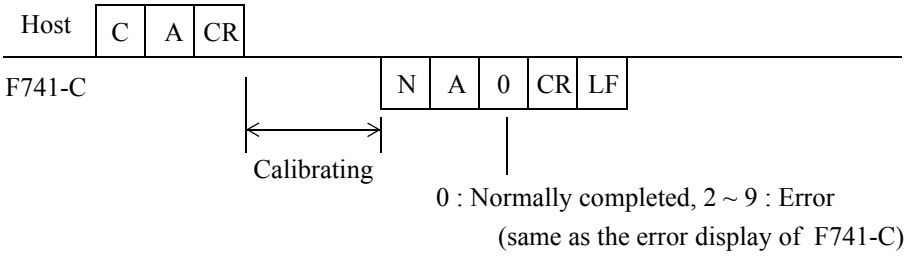
※ For setting value No., refer to "8-1-7.Setting value communication format" on P.72.

・Read out the set value

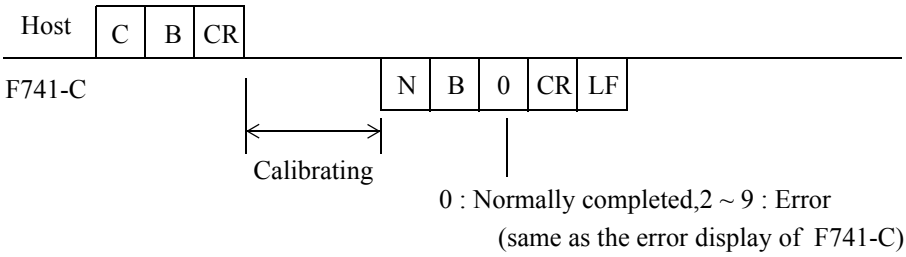


※ For setting value No., refer to "8-1-7.Setting value communication format" on P.72.

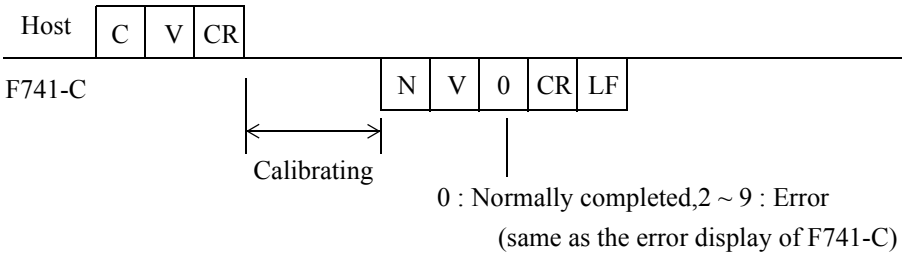
· Zero calibration



· Span calibration



· Equivalent input calibration

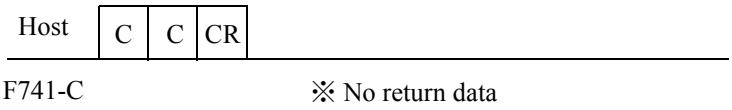


Request

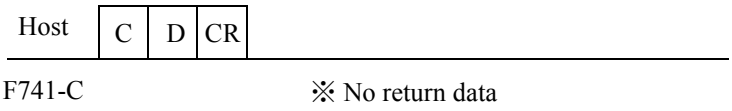
Zero calibration · Span calibration · Equivalent input calibration

Before sending this command, set the capacity, min. scale division and balance weight value.

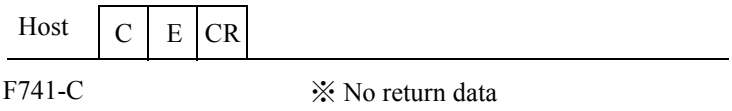
· Gross weight selection



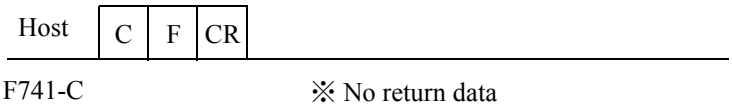
· Net weight selection



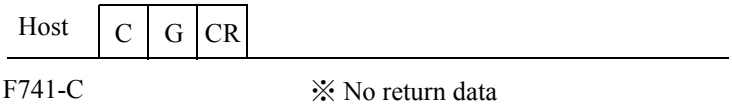
· Tare subtraction



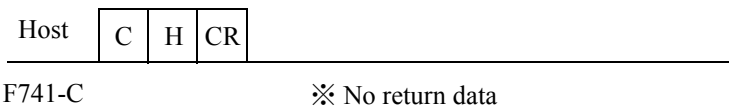
· Tare subtraction reset



· Digital zero



· Digital zero reset



8-1-7. Setting value communication format

Use the following for reading and writing set values.

Set Point 2	W 1 1	(When LOCK1 can not write in)
Final (Target value)	W 1 2	(When LOCK1 can not write in)
Over	W 1 3 0	(When LOCK1 can not write in)
Under	W 1 4 0	(When LOCK1 can not write in)
Compensation	W 1 5 0	(When LOCK1 can not write in)
Judging time	W 2 0 0 0 0	(When LOCK2 can not write in)
Comparison inhibit time	W 2 1 0 0	(When LOCK2 can not write in)
Upper limit	W 2 2	(When LOCK1 can not write in)
Lower limit	W 2 3	(When LOCK1 can not write in)
Near zero	W 2 4	(When LOCK1 can not write in)
Tare weight	W 2 5	(When LOCK1 can not write in)
Complete output time (Hold)	W 2 8 0 0 0	(When LOCK2 can not write in)
Weighing function 1	W 3 1	(When LOCK2 can not write in)
Weighing function 2	W 3 2 0	(When LOCK2 can not write in)
Function key invalid	W 3 4	
Digital filter	W 3 5 0 0	(When LOCK2 can not write in)
Motion detection period	W 3 6 0 0 0	(When LOCK2 can not write in)
Motion detection range	W 3 7 0 0 0	(When LOCK2 can not write in)
Zero tracking period	W 3 8 0 0 0	(When LOCK2 can not write in)
Zero tracking range	W 3 9 0	(When LOCK2 can not write in)

Setting value No. — 5-digit setting value (max.)

※ Where the setting is 0, do not enter other values than 0.

Balance weight value	W 4 0	(When LOCK2 and LOCK SW can not write in)
Capacity	W 4 1	(When LOCK2 and LOCK SW can not write in)
Min. scale division	W 4 2 0 0	(When LOCK2 and LOCK SW can not write in)
Display selection	W 4 5 0	(When LOCK2 can not write in)
DZ regulation value	W 4 7 0	(When LOCK2 and LOCK SW can not write in)
Gravitational acceleratio	W 4 8	(When LOCK2 can not write in)
Equivalent input voltage value	W 4 9	(When LOCK2 and LOCK SW can not write in)
D/A output mode	W 5 2 0 0 0	(When LOCK2 can not write in)
D/A zero output weight	W 5 3	(When LOCK2 can not write in)
D/A full scale	W 5 4	(When LOCK2 can not write in)
PROFIBUS I/F setting	W 5 8 0 0 0	(When LOCK2 can not write in)
Station No.	W 5 9 0 0	(When LOCK2 can not write in)

Setting value No. — 5-digit setting value (max.)

※ Where the setting is 0, do not enter other values than 0.

8-1-8. About the auto print function

The F741-C has an auto print function by which the RS-232C format can be sent automatically.

To use this function, there is a need to set the following in advance.

● Setting of auto print mode (Setting Mode 2-7 Weighing function 1)

Set either 1: auto print ON or 2: auto print ON, weight value hold (manual print invalid).

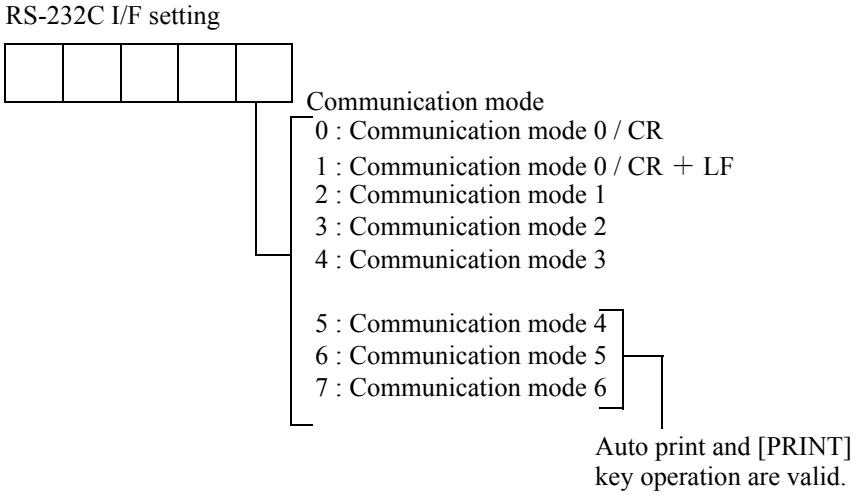
※ If 0 (auto print OFF) is set, the RS-232C format can be sent at the time of pressing the PRINT key on the front panel.

Weighing function 1

Auto print mode
- 0 : Auto print OFF (manual print valid)
- 1 : Auto print ON (manual print invalid)
- 2 : Auto print ON, Weight value hold (manual print invalid)

● Setting of communication mode (Setting mode 4-1　RS-232C I/F setting)

Set any of "5 : Communication mode 4", "6 : Communication mode 5",
"7 : Communication mode 6".



The timing of auto sending of the RS-232C format differs according to the setting state of the comparison mode.

● Timing of auto sending of the RS-232C format

(1) Comparison mode 0(Upper/Lower limit comparison mode)

It is sent at the time of change from a non-stable to a stable state beyond near zero.

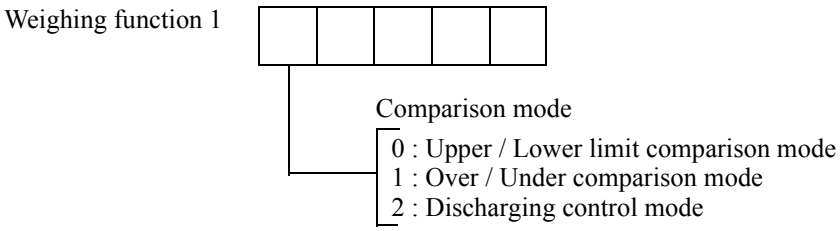
(2) Comparison mode 1(Over/Under comparison mode)

It is sent at the time of change from a non-stable to a stable state beyond near zero.

(3) Comparison mode 2(Discharging control mode)

It is sent at the time of start of the COMPLETE signal output.

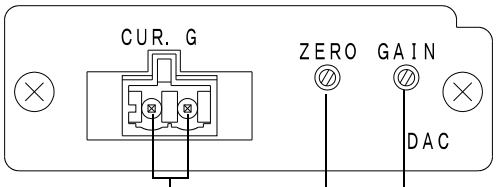
※ Determine the comparison mode by setting mode 2-7 (Weighing function 1).



8-2. D/A Converter［DAC］

The D/A converter is an interface to output measured weight values as electrical signals.
Current in proportion to the weight value (4mA ~ 20mA) can be output.
The over range is ± 5% of the full scale.

8-2-1. Name of each part



・Gain fine trim potentiometer

For fine adjustment of gain. Trimmer adjusts output to 20.00mA for full scale.
Gain can be adjusted through the front panel as well.

・Zero fine trim potentiometer

For fine adjustment of zero. Trimmer adjusts output to 4.00mA for zero.
Zero can be adjusted through the front panel as well.

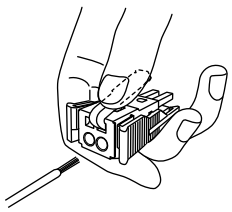
・Current output terminals

The terminals for current output of 4 ~ 20mA. Connect an instrument whose load resistance is less than 350 Ω.

Request

The trimmer is for fine adjustment.
Temperature drift may increase if you have severely changed the value that had been set when you first received the product, please adjust it within a range of ± 0.2mA.

⚠ CAUTION

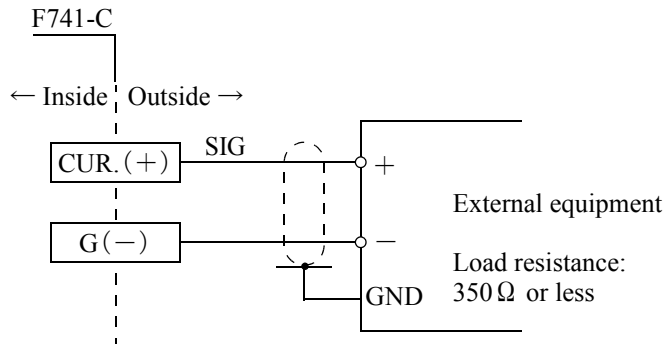


・Pick up the plug then handle the lever with thumb.

・Do not handle the lever when the plug is attached to the base otherwise it may cause some trouble.

▪ Taking current output signals

Connect an external equipment (load resistance 350 Ω or less) between CUR.(+) ~ G(-) of F741-C.



⚠ CAUTION

Do not apply voltage or current to the current output terminal externally by mistake.
Doing so will cause breakage.

8-2-2. Specifications

Weight values are output as converted to analog signals of current.
Zero output weight value and full scale weight value can be set.

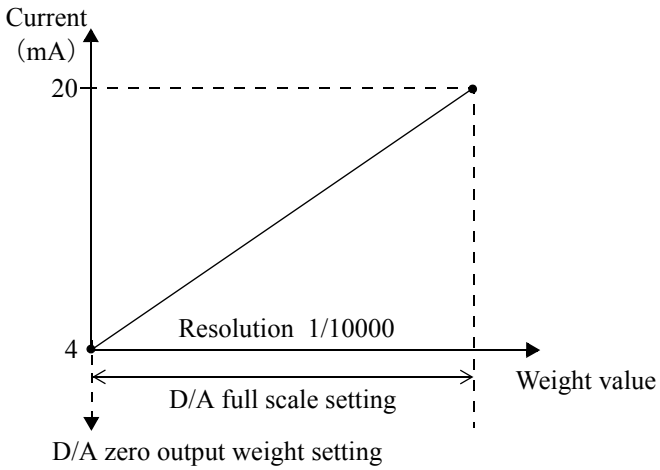
Current output	4mA ~ 20mA(Load resistance 350 Ω or less)
D/A conversion speed	200 times/sec.
Resolution	1/10000
Over range	± 5% of the full scale (3.2mA ~ 20.8mA)
Zero drift	Within 0.3 μ V/ ℃
Gain drift	Within 30ppm/ ℃
Non-linearity	Within 0.02%/FS ※ Not including the drift of the analog input section
Output connector	Cage clamp type terminal board (two-piece type)
Potentiometer	A potentiometer to readjust (fine-adjust) ZERO (4mA) and GAIN (20mA) is placed on the rear panel.

(The adjustable range is a few percentage.)

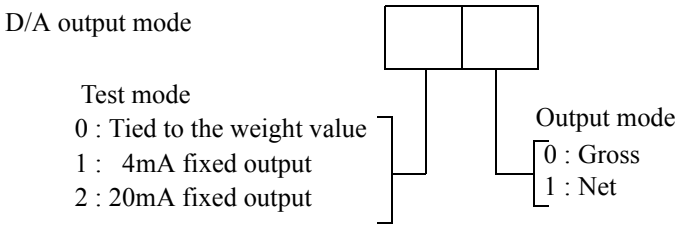
(4mA and 20mA are factory-adjusted.)

8-2-3. Method of adjusting the d/a zero and gain

The D/A converter of the F741-C obtains analog output by setting the range of the weight value to output 4mA of current and the weight value to output 20mA of current, respectively. Input each setting value and select D/A output mode in setting mode 4. When tied to the weight value is selected, it outputs the current to indicated value. Therefore, while the indicated value is held, the analog output is also held.



a) D/A output mode (Setting mode 4-2)



b) D/A zero output weight (Setting mode 4-3) **Input range / 0 ~ 99999**

Input the weight value to output 4mA.

c) D/A full scale (Setting mode 4-4) **Input range / 0 ~ 99999**

Input the range of the weight value to output 20mA.

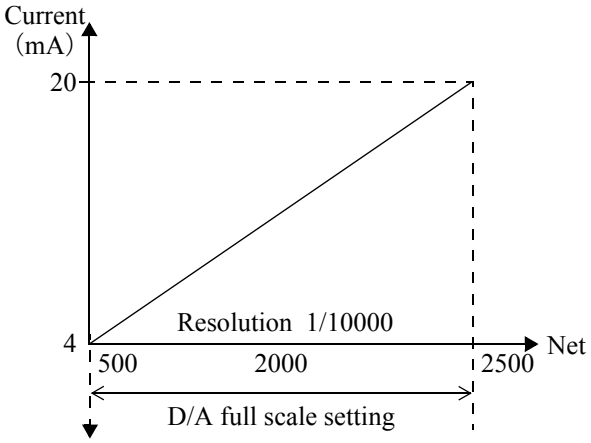
Example

When setting is as follows:

D/A output mode : 01

D/A zero output weight : 00500

D/A full scale : 02000



D/A zero output weight setting

	Net	Current (mA)
	480	3.84
Zero →	500	4.00
	1000	8.00
Full scale	1500	12.00
	2500	20.00
	2520	20.16

8-2-4. About D/A resolution

The resolution of the D/A converter is 1/10000 with respect to 4 ~ 20mA.

That is, the minimum unit of current is as follows:

$(20 \sim 4\text{mA}) \times 1/10000 = 1.6\,\mu\text{A}$

Also, the minimum unit of weight value is as follows:

(D/A Full Scale setting value) × 1/10000

8-3. Profibus interface［PRF］

Introduction

The F741-C PROFIBUS I/F is described in this chapter.

For reading it, basic knowledge of PLC and PROFIBUS is required.

For basic knowledge of PROFIBUS, see specialized references.

8-3-1. Specifications

・The F741-C mounted with the PROFIBUS I/F can be connected as a slave device to a PROFIBUS fieldbus. (Compatible with PROFIBUS-DP V0.)

・Communication speed: 9.6 kbps - 12 Mbps (automatically following the master)

・Occupied memory: OUT/12 bytes (6 words)

IN/20 bytes (10 words)

※ In allocation, be careful to prevent the address from overlapping with other slaves.

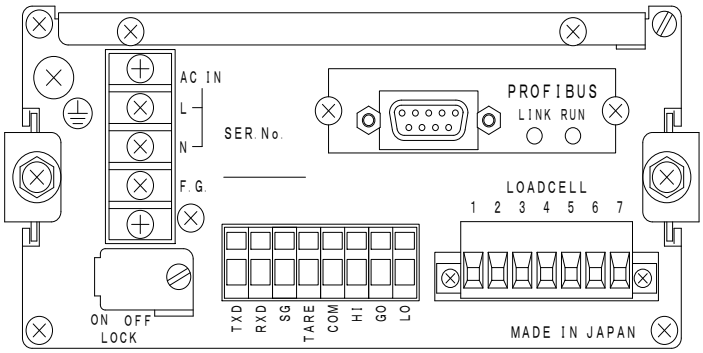
・Station No. : 0 - 125

・Sync mode and freeze mode are supported.

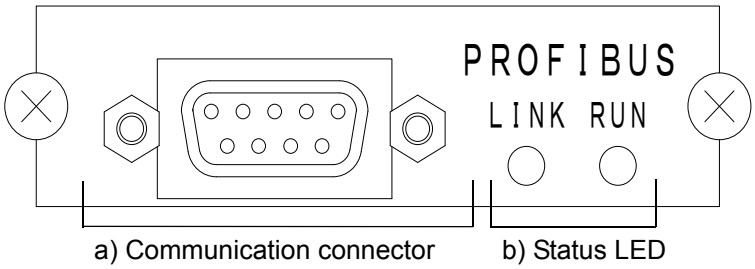
・Special clear mode (Fail safe mode) is not supported.

8-3-2. Dimensions

F741-C rear panel with the PROFIBUS I/F option mounted



8-3-3. Name of each part



a) Communication connector

This is a connector (9-pin D-SUB connector socket type) for connecting the F741-C with PROFIBUS. The function of each signal is as follows:

Pin No.	Signal name	Function
1	—	(Not used)
2	—	(Not used)
3	RXD / TXD-P	Data reception/send data plus
4	CNTR-P	Data reception/send data plus
5	DGND	Data ground (0V)
6	VP	Communication power (V5)
7	—	(Not used)
8	RXD / TXD-N	Data reception/send data minus
9	—	(Not used)

※ Prepare 9-pin D-Sub connector plug type for the connection.

※ Use a PROFIBUS-qualified connector and cable.
For PROFIBUS-qualified products, contact the PROFIBUS Organization.

※ When the F741-C comes at the end, be sure to connect a terminal resistor.
For the method of connecting the terminal resistor, check with specialized references.

b) Status LED

- LINK : Lights while the F741-C is linked with the master.
- RUN : Lights when the F741-C is normal.

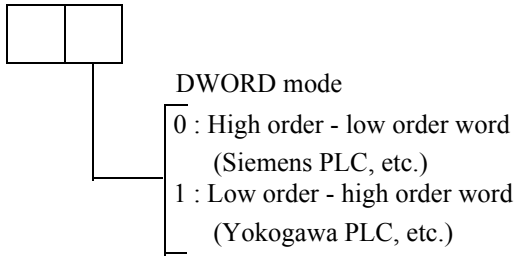
8-3-4. F741-C settings

● PROFIBUS I/F (Setting mode 4-5)

When the data on the address map is DWORD (long word), assignment of high order and lower order can be determined.

The setting made here is common to IN data and OUT data.

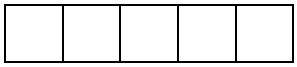
PROFIBUS I/F settings



● PROFIBUS baud rate display (Setting mode 4-6)

In communication, the master device is automatically followed. That baud rate is displayed.

PROFIBUS baud rate display



Display pattern					Function
			1	2	12 Mbps
				6	6 Mbps
				3	3 Mbps
			1.	5	1.5 Mbps
		5	0	0	500 kbps
	1	8	7.	5	187.5 kbps
	9	3.	7	5	93.75 kbps
		1	9.	2	19.2 kbps
			9.	6	9.6 kbps
	—	—	—	—	Not linked or no PROFIBUS I/F mounted

● Station No.(Setting mode 4-7)

Set the station address. Input range / 0 ~ 125

※ Station address change from the master is not supported.

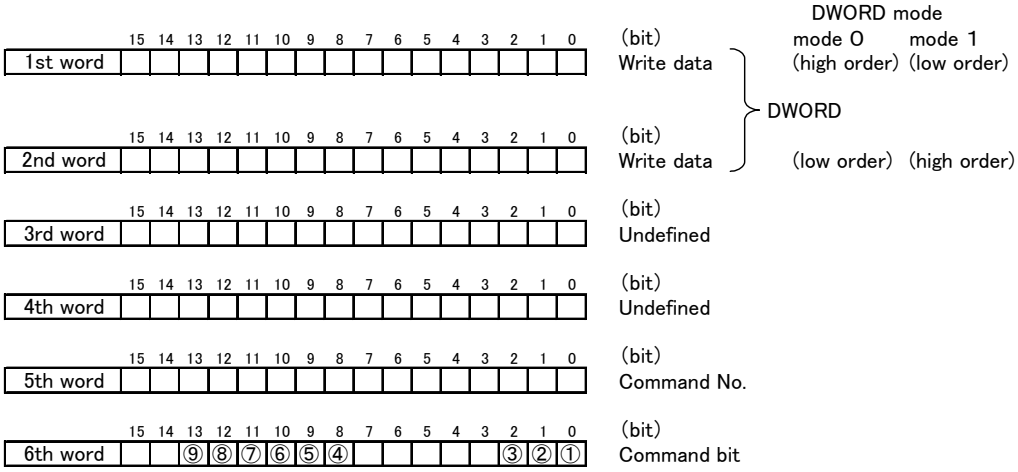
8-3-5. Address map

This product occupies OUT/12 bytes (6 words) and IN/20 bytes (10 words) memory.
In allocation, be careful to prevent the address from overlapping with other slaves.
The data used for writing and reading is handled with the decimal point ignored, but the F741-C recognizes the decimal point at the specified digit position.
For example, when "50" is written in Judging Time from PLC to F741-C, the F741-C handles it as 5.0 [sec].

＊ In the following explanation, ON corresponds to 1 and OFF corresponds to 0.
Also, an ON edge corresponds to (0 → 1), and an OFF edge corresponds to (1 → 0).

a) OUT data (6 words)

PLC → F741-C



① R/W (R : 1 / W : 0)
② Command request
③ “Keep alive” confirmation request

④ Digital zero
⑤ Digital zero reset
⑥ TARE
⑦ TARE reset
⑧ Display switching; gross weight
⑨ Display switching; net weight

※Do not perform more than two operations of ④～⑨ at the same time.

〈Explanation about OUT data〉

◎ Write data

Use this when writing data by using the command request.

Write data consists of 32-bit binary (2 words), the high order and low order of which are changed by DWORD mode (PROFIBUS I/F in setting mode 4-5) of the F741-C.

◎ Command No.

For writing data, specify the command No. of the data you want to specify in advance. The high byte is not used.

For command Nos., see the following list.

Be aware that Command No. response and Reading data are both adjusted to 0 and the Command response is turned ON for invalid command NO..

Moreover, when LOCK is activating, it is not possible to write it.

(The Command response returns ON.)

Setting value	Command No.	Input range	
Set point 1	11	0 ~ 99999	LOCK1
Final (Target value)	12	0 ~ 99999	LOCK1
Over	13	0 ~ 9999	LOCK1
Under	14	0 ~ 9999	LOCK1
Compensation	15	0 ~ 9999	LOCK1
Judging time	20	0 ~ 99	LOCK2
Comparison inhibit time	21	0 ~ 999	LOCK2
Upper limit	22	0 ~ 99999	LOCK1
Lower limit	23	0 ~ 99999	LOCK1
Near zero	24	0 ~ 99999	LOCK1
Tare setting	25	0 ~ 99999	LOCK1
Complete output time (Hold time)	28	0 ~ 99	LOCK2

※ In communication, setting values are all handled with the decimal point ignored.

◎ R/$\overline{W}$(R : 1 / $\overline{W}$: 0)

Specify the command "READ/WRITE."

READ : Turn ON for reading various setting values of the F741-C.

WRITE : Turn OFF for writing setting values to the F741-C.

◎ Command request

Give an ON edge to execute the read or write command.

◎ "Keep alive" confirmation request

By operating this bit, whether the F741-C is operating normally can be confirmed. The F741-C side outputs this bit to the "keep alive" confirmation response as its state is inverted.

◎ Digital zero

Gross weight is zeroed by the ON edge.

◎ Digital zero reset

Digital zero is reset by the ON edge.

◎ TARE

Tare subtraction is executed by the ON edge.

◎ TARE reset

Tare subtraction is reset by the ON edge.

◎ Display switching: Gross

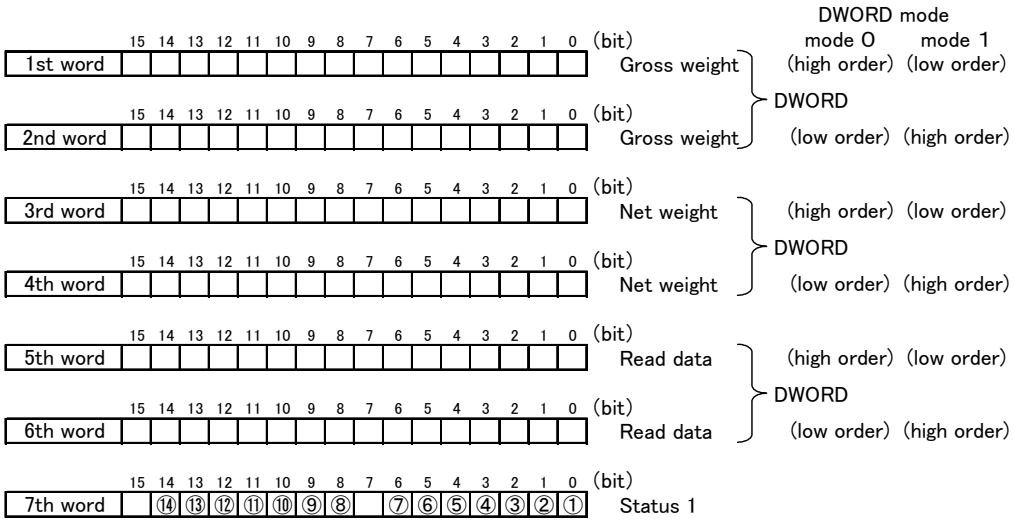
Weight display is switched to gross weight by the ON edge.

◎ Display switching: Net

Weight display is switched to net weight by the ON edge.

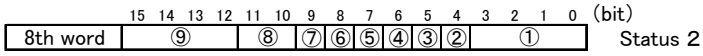
b) IN data (10 words)

F741-C → PLC

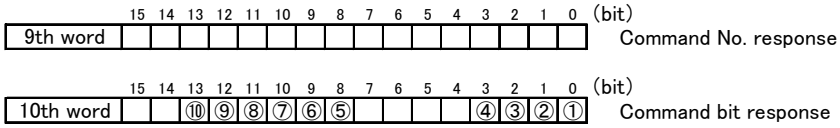


① Weight value hold
② Weight value zero alarm
③ Weight value stable
④ In tare subtraction
⑤ Weight display; gross weight/net weight (net: 1/gross: 0)
⑥ Rear LOCK SW
⑦ Weight value alarm

⑧ Near zero
⑨ Upper limit/over — Upper/Lower limit comparison mode
⑩ Go — Over/Under comparison mode
⑪ Lower limit/under
⑫ Set point 2
⑬ Final — Discharging control mode
⑭ Complete



① Calibration error number (0～9)
② OFL1
③ OFL2
④ OFL3
⑤ +LOAD
⑥ −LOAD
⑦ Excitation voltage error
⑧ Decimal place (0～3)
⑨ Unit (0～9)



① $\overline{\text{R/W}}$ response
② Command response
③ "Keep alive" confirmation response
(The state of the "keep alive" confirmation bit is set as it is inverted.)
④ Remote READY ("1" is set after completion of initialization.)

⑤ Digital zero response
⑥ Digital zero reset response
⑦ Tare subtraction response
⑧ Tare subtraction reset response
⑨ Display switching; gross weight response
⑩ Display switching; net weight response

〈Explanation about IN data〉

◎ Gross weight (signed 32-bit binary / － 99999 ~ 99999)

Indicates gross weight. In the case of minus data, the highest-order bit becomes 1.

The gross weight indicated here is constantly updated. No request signal, etc., is required.

The high order and low order are changed by DWORD mode (PROFIBUS I/F in setting mode 4-5) of the F741-C.

◎ Net weight (signed 32-bit binary / － 99999 ~ 99999)

Indicates net weight. In the case of minus data, the highest-order bit becomes 1.

The net weight indicated here is constantly updated. No request signal, etc., is required.

The high order and low order are changed by DWORD mode (PROFIBUS I/F in setting mode 4-5) of the F741-C.

◎ Read data (signed 32-bit binary / － 99999 ~ 99999)

Indicates command No.-specified data. In the case of minus data, the highest-order bit becomes 1.

The data indicated here is updated each time the ON edge of the command request is received.

The high order and low order are changed by DWORD mode (PROFIBUS I/F in setting mode 4-5) of the F741-C.

◎ Weight value hold

Turns ON while the weight value is held.

◎ Weight value zero error

Turns ON as a zero alarm (ZALM) occurs when the total amount of digital zero exceeds the DZ regulation value by digital zero and zero tracking operation.

◎ Weight value stable

Turns ON while the weight value is stable.

◎ In tare subtraction

Turns ON when tare subtraction is performed.

◎ Weight display; gross weight/net weight

Turns ON while net weight is displayed, and OFF while gross weight is displayed.

◎ Rear LOCK SW

Turns ON when the rear LOCK SW is ON.

Turns OFF when the LOCK SW is OFF.

◎ Weight value error

Turns ON when any of ± LOAD, OFL1, OFL2, OFL3, and ZALM occurs.

◎ Near zero

Turns ON when the weight value ≦ near zero setting value.

◎ Upper limit / Over

Turns ON when the weight value > upper limit setting value in upper/lower limit comparison mode.

Turns ON when the weight value > (Target value + Over) in over/under comparison mode.

◎ Go

Turns ON when the lower limit setting value ≦ weight value ≦ upper limit setting value in upper/lower limit comparison mode.

Turns ON when (Target value - Under) ≦ weight value ≦ (Target value + Over) in over/under comparison mode.

◎ Lower limit / Under

Turns ON when the weight value < lower limit setting value in upper/lower limit comparison mode.

Turns ON when the weight value < (Target value - Under) in over/under comparison mode.

◎ Set point 1

Turns ON when the weight value ≧ (Final - Set point 1).

◎ Final

Turns ON when the weight value ≧ (Final - Compensation).

◎ Complete

Turns ON while the COMPLETE signal is output.

◎ Calibration error number (4-bit binary / 0 ~ 9)

Indicates calibration error number. "0" indicates no error (normal).

◎ OFL1

Turns ON when the net weight > 99999.

◎ OFL2

Turns ON when the gross weight > (Capacity + 9 scale divisions).

◎ OFL3

Turns ON when the gross weight > 99999.

◎＋ LOAD

Turns ON when a signal exceeding the input signal range of the F741-C is inputted.

◎－ LOAD

Turns ON when a signal dropping below the input signal range of the F741-C is inputted.

◎ Excitation voltage error

Turns ON when the excitation voltage exerted on the loadcell is low.

◎ Decimal place (2-bit binary / 0 ~ 3)

Indicates the decimal point position (display selection in setting mode 3-5) of the F741-C.

◎ Unit (4-bit binary / 0 ~ 9)

Indicates the unit setting (display selection in setting mode 3-5) of the F741-C.

◎ Command No. response

Returns the same value as the OUT data command No. when the command response turns ON.

The high byte is not used.

◎ R/$\overline{W}$ response

Returns the same state as **R/$\overline{W}$** of OUT data command bit.

◎ Command response

Turns ON upon completion of execution of the read or write command.

Turns OFF after confirming that the command request is OFF.

◎ Keep alive confirmation response

Constantly outputs the "keep alive" confirmation request as it is inverted.

◎ Remote ready

Turns ON when initialization of the F741-C is finished.

Various kinds of processing should be started after confirming that this bit is ON.

◎ Digital zero response

Turns ON after execution upon receiving the command bit "digital zero."

Turns OFF after confirming that the command bit "digital zero" is OFF.

◎ Digital zero reset response

Turns ON after execution upon receiving the command bit "digital zero reset."

Turns OFF after confirming that the command bit "digital zero reset" is OFF.

◎ TARE response

Turns ON after execution upon receiving the command bit "tare subtraction."

Turns OFF after confirming that the command bit "tare subtraction" is OFF.

◎ TARE reset response

Turns ON after execution upon receiving the command bit "tare subtraction reset."

Turns OFF after confirming that the command bit "tare subtraction reset" is OFF.

◎ Display switching: Gross response

Turns ON after execution upon receiving the command bit "display switching; gross weight."

Turns OFF after confirming that the command bit "display switching; gross weight" is OFF.

◎ Display switching: Net response

Turns ON after execution upon receiving command bit "display switching; net weight."

Turns OFF after confirming that the command bit "display switching; net weight" is OFF.

8-3-6. Read, write, and command procedures

a) Write procedure

(1) Turn OFF R/$\overline{W}$, and specify WRITE.

(2) Specify the command No. of the setting value to write.

(3) Set data in the write data area.

(4) Execute the ON edge of the command request.

(5) On the F741-C side, take in the write data, and turn ON the command response.

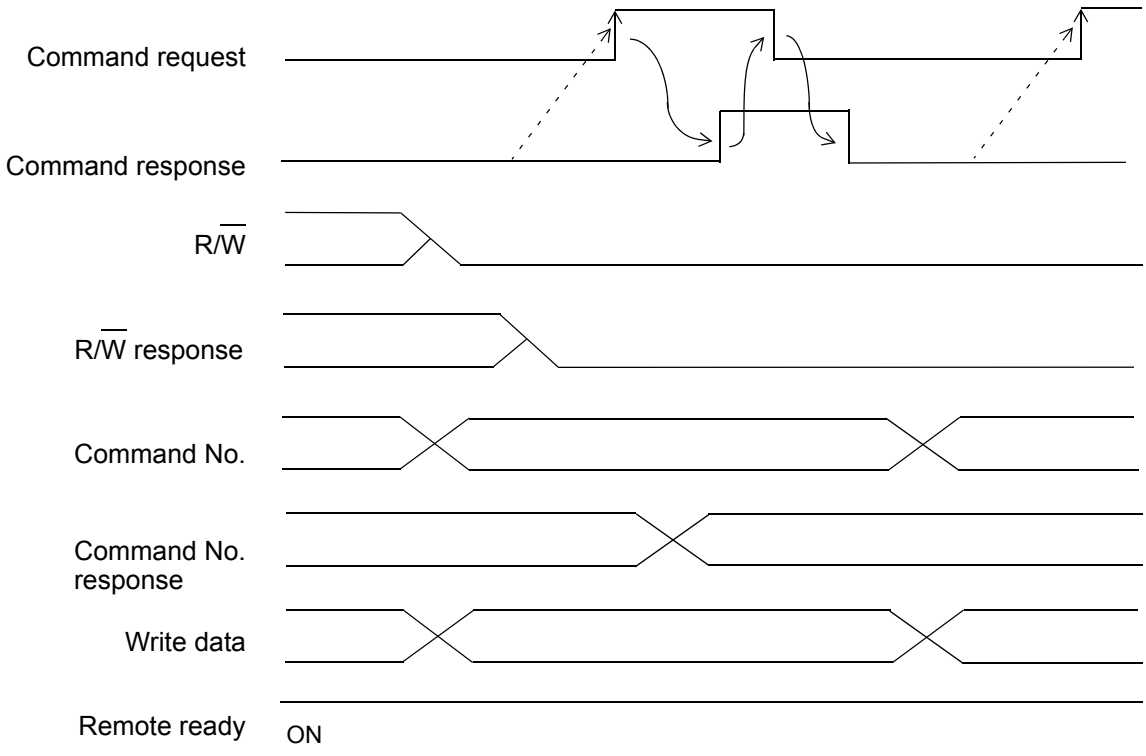
(6) To turn OFF the command request, do it after confirming that the command response is ON.

(7) When the command request is turned OFF, the command response also turns OFF.

Notice

※ To execute the ON edge of the command request, make sure to do it after confirming that the command request is OFF.

※ Immediately after power-on, the remote READY may not be ON. In this case, execute processing after waiting until it becomes ON.



b) Read procedure

(1) Turn ON R/$\overline{W}$, and specify READ.

(2) Specify the command No. of the setting value to read.

(3) Execute the ON edge of the command request.

(4) On the F741-C side, set the setting value in the read data area, and turn ON the command response.

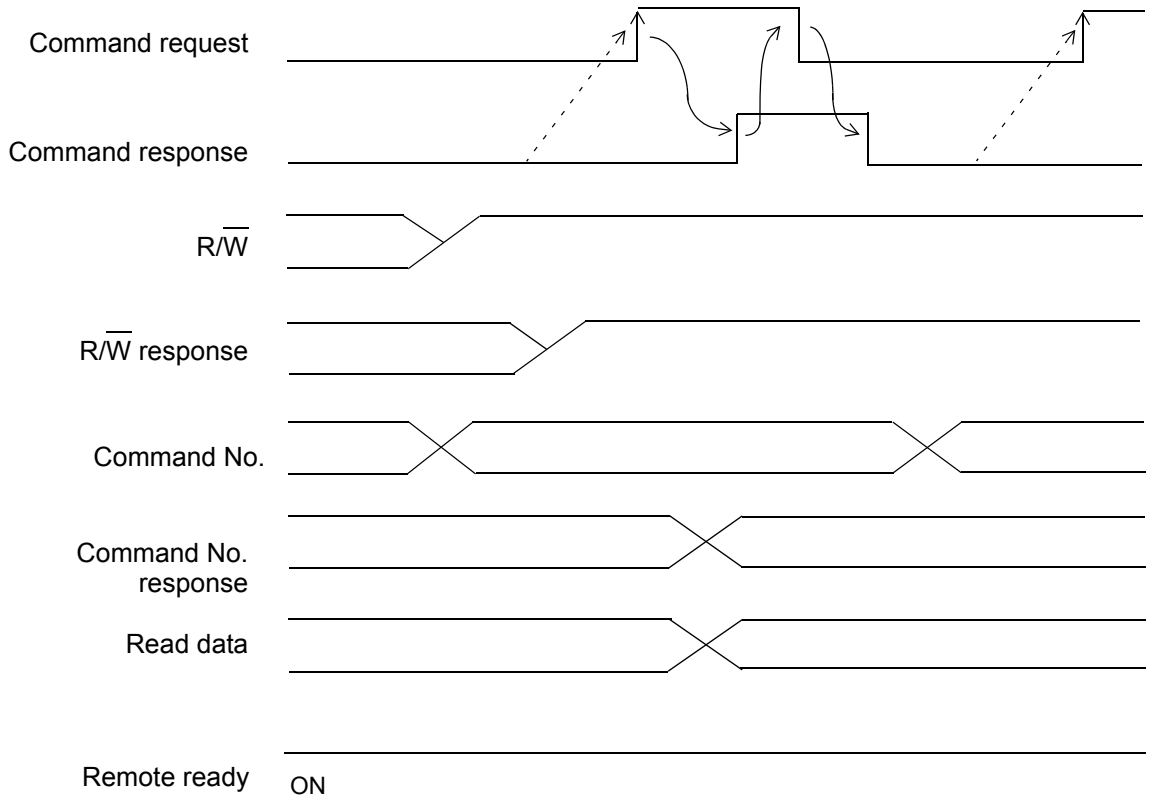
(5) After confirming that the command response is ON, read the data.

(6) When the command request is turned OFF, the command response also turns OFF.

Notice

※ To execute the ON edge of the command request, make sure to do it after confirming that the command request is OFF.

※ Immediately after power-on, the remote READY may not be ON. In this case, execute processing after waiting until it becomes ON.



c) Command procedure

(1) Turn OFF all the bits from [④ digital zero] to [⑨ display switching; net weight] out of the command bits.

(2) Turn ON the bit of the command to execute.

(3) On the F741-C side, execute the command, and then turn ON the corresponding command bit response.

(4) To immediately turn OFF the command bit, do it after confirming that the command bit response is ON.

(5) When the command bit is turned OFF, the corresponding command bit response also turns OFF.

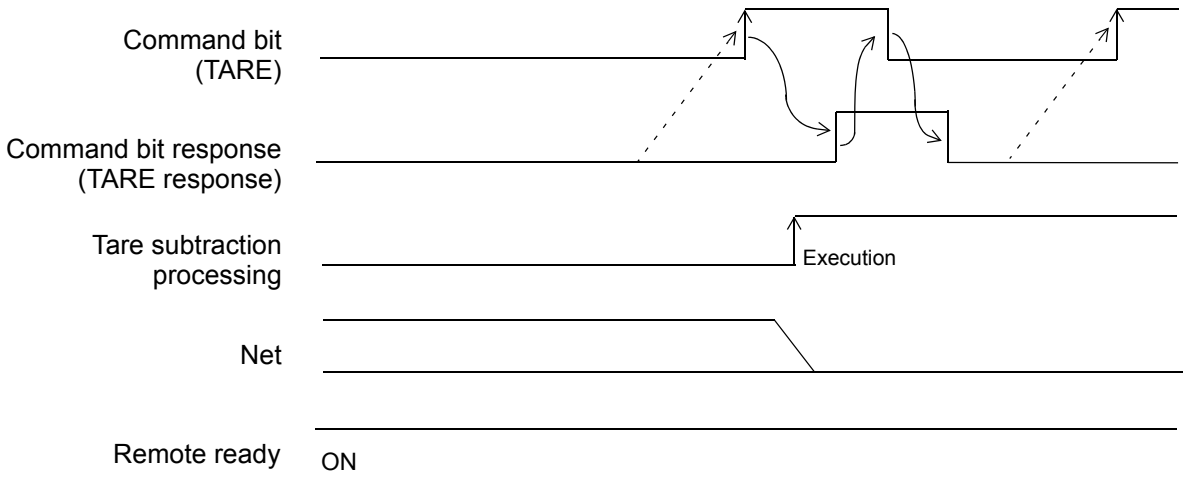
Notice

※ To execute the ON edge of the command request, make sure to do it after confirming that the command request is OFF.

※ To execute any one of the command bits from [④ digital zero] to [⑨ display switching; net weight], do not execute two or more simultaneously.

※ Immediately after power-on, the remote READY may not be ON. In this case, execute processing after waiting until it becomes ON.

Example) Execution of the command bit of [⑥ tare subtraction]



9. OVER SCALE & ERROR

9-1. Over scale

The weight error output turns ON.

The input of A/D converter overflowed	LoAd
Net weight ＞ 99999	oFL 1
Gross weight ＞ Capacity + 9 scale division	oFL2
Gross weight ＞ 99999	oFL3

※ Net weight = Gross weight - Tare weight

9-2. Calibration error

Error item	Alarm message
The initial tare is beyond the zero adjustment range.	c Err2
The initial tare is minus.	c Err3
The input balance weight is beyonde the capacity.	c Err4
The balance weight is “00000”.	c Err5
The load cell output dose not reach the span adjustment range.	c Err6
The load cell output is miunus.	c Err7
The load cell output is beyond the span adjustment range.	c Err8
The weight value is not stable and calibration stopped.	c Err9

10. TROUBLE SHOOTING

● **Over-scale display**

LoAd (A/D converter over)

Input signal from the load cell exceeds F741-C input signal range.
Check whether the output of the load cell is within span adjutment range;
Check there are breakages in the cable which is connected to the F741-C and the load cell;
This display may appear when nothing is connected to the loadcell input terminal block on the rear panel.

- LoAd (A/D converter minus over)

Input signal from the load cell is lower than F741-C input signal range range.
Check whether the output of the load cell for falling short of the span adjustment range.
Check there are breakages in the cable which is connected to the F741-C and the load cell.
This display may appear when nothing is connected to the loadcell input terminal block on the rear panel.

oFL 1 (Net weight > 99999)

The net weight exceeds 99999 (display allowable limit). To put this over scale display back to a normal weight display, lower the input signal from the loadcell until the over scale display goes out.

oFL 3 (Gross weight > 99999)

Gross weight exceeds the Gross Over set value.
Decrease the signal coming from the load cell until the normal display returns; or reset the Gross Over value.

oFL2 (Gross weight > Capacity + 9 scale division)

Gross weight exceeds Capacity + 9 scale division.
Decrease the signal coming from the load cell until the normal display returns.

Request

Scale a capacity is primary data for the F741-C. You must re-calibrate if capacity is changed .

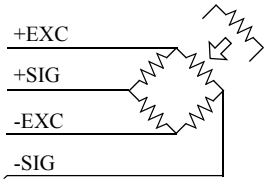
Do not change capacity to reset over scale message (oFL2).

● Calibration error display

c Err2 (Calibration error)

Initial dead load is above zero adjustment range.

Remove any excess load from load cell or scale. If " c Err2 " is still displayed, connect a resistor between +EXC and -SIG load cell connections.
This should shift the Zero point. Do Zeo calibration again.



Connect the resistor
between +EXC and -SIG.

Resistor		Strain	
Ideal	Approx.	μ-STRAIN	mV/V
875 kΩ	866 kΩ	200	0.1
437 kΩ	442 kΩ	400	0.2
291 kΩ	294 kΩ	600	0.3
219 kΩ	221 kΩ	800	0.4
175 kΩ	174 kΩ	1000	0.5
146 kΩ	147 kΩ	1200	0.6
125 kΩ	124 kΩ	1400	0.7
109 kΩ	110 kΩ	1600	0.8
97 kΩ	97.6 kΩ	1800	0.9
87.3 kΩ	86.6 kΩ	2000	1.0
79.4 kΩ	78.7 kΩ	2200	1.1
72.7 kΩ	73.2 kΩ	2400	1.2
67.1 kΩ	66.5 kΩ	2600	1.3
62.3 kΩ	61.9 kΩ	2800	1.4
58.2 kΩ	57.6 kΩ	3000	1.5
54.5 kΩ	54.9 kΩ	3200	1.6
51.3 kΩ	51.1 kΩ	3400	1.7
48.4 kΩ	48.7 kΩ	3600	1.8
45.9 kΩ	46.4 kΩ	3800	1.9
43.6 kΩ	43.2 kΩ	4000	2.0
41.5 kΩ	41.2 kΩ	4200	2.1
39.6 kΩ	39.2 kΩ	4400	2.2
37.9 kΩ	38.3 kΩ	4600	2.3
36.3 kΩ	36.5 kΩ	4800	2.4
34.8 kΩ	34.8 kΩ	5000	2.5

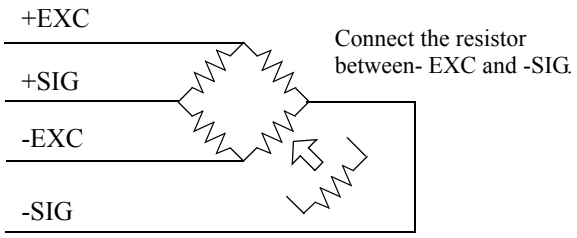
- This table is for a 350Ω load cell.
- The temperature coefficient of the connected resistor directly influences the accuracy of the indicator. Use a resistance having a temperature coefficient of 50ppm/℃ or more (recommended value of about 5ppm/ ℃).

c Err3 (Calibration error)

Inditial dead load is negative.

Check that load cell is mounted in the correct direction; check that load is being applied to the load cell in the correct direction ; check that the +SIG and -SIG lines are propely connected.

If " c Err3 " still displayed, connect a resistor between -EXC and -SIG load cell connections. This should shift the zero point. Do zero calibration again. The connected resistance and the relation of the Input signal are the same as " c Err2 " .



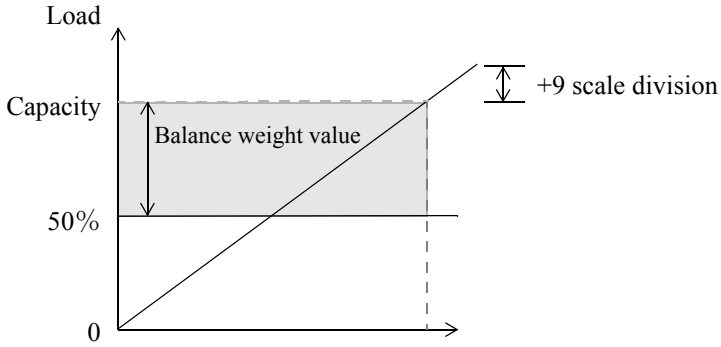
c Err4 (Calibration error)

The balance weight value is larger than the capacity.

Re-enter the balance weight value equal to or less than the capacity.

Do span calibration again.

The relationship between capacity and balance weight value



Balance weight value must be between 50% to 100% of capacity in order to do span calibration correctly.

c Err5 (Calibration error)

The set balance weight value is “00000”. set adequate value to balance weight value.

c Err6 (Calibration error)

The load cell output dose not reach the span adjustment range of the F741-C.
Check how load is applied to load cell; check load cell has sufficient outpul (mV/V) to reach span range. Do span calibration again.

c Err7 (Calibration error)

Load cell output is negative.
Check that load cell is mounted in the correct direction; check that load is being applied to the load cell in the correct direction; check that the +SIG and -SIG lines are propely connected. Do span calibration again.

c Err8 (Calibration error)

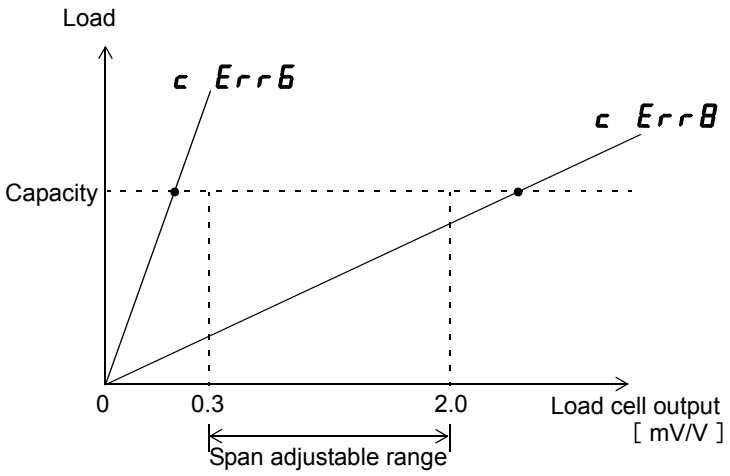
Load cell output is beyond span adjustment range of the F741-C.
Check how load is applied to load cell; check load cell has sufficient output (mV/V) to reach span range. Do span calibration again.

c Err9 (Calibration error)

The load is not stable enough for correct calibration.

Adjust the stable period and stable range of motion detection so " STAB ● " display lights during calibration. Do calibration again.

The span adjustable range of the F741-C is 0.3 ~ 2.0 (mV/V).
Since display to the capacity is guaranteed in span calibration, calibration cannot be performed if the load cell output is under 0.3 (mV/V) (c Err6) or exceeds 2.0(mV/V) (c Err8) when the capacity is reached.



● **Excitation voltage error display**

EuErr (EXC Error)

The load cell excitation voltage has dropped.

Check the cables connecting the F741-C and load cell for excessive load, and check to see if the wiring is correct.

● **Checksum error display**

AddErr(Checksum error)

It is displayed if a checksum error occurs in self-checking or at power-on.

● **NOV RAM error display**

nouErr (NOV RAM check error)

It is displayed if a NOV RAM check error occurs in self-checking and at the time of normal use.

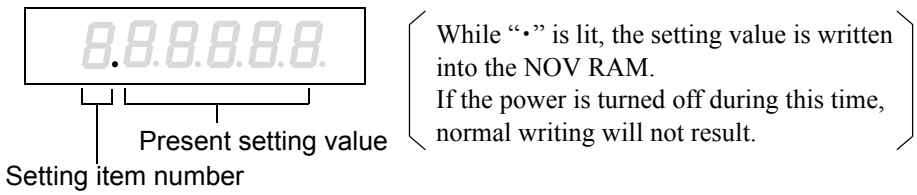
* When checksum error or NOV RAM check error is displayed, the F701-C is out of order.

  Request repair from your distributor or us.

● **The setting value is not changed.**

There is a possibility that writing to the NOV RAM is interrupted, so that the setting value is not changed.

If any setting value stored in the NOV RAM is changed, the "・" (position shown below) lights.



While "・" is lit, do not turn off the power of the F741-C.

11. PRECAUTIONS IN SETTING AND COMMAND EXECUTION

This F741-C stores all setting values and some states in NOV.RAM (non-volatile RAM). If setting values, etc., are mechanically written over and over again, its life may become short: therefore, they are stored by the methods from (1) to (3) shown below.

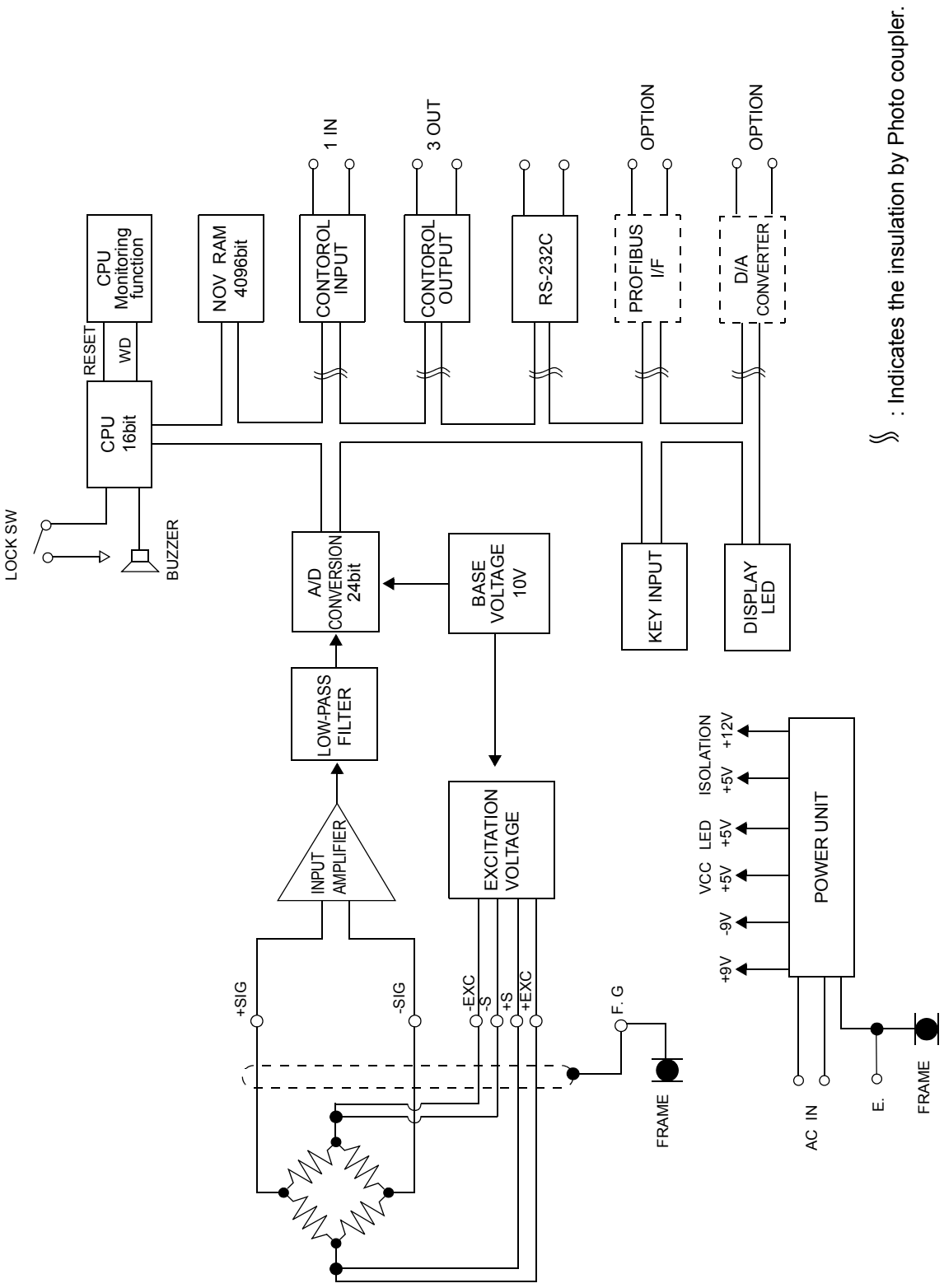
While the power is on, operation, display, etc., are not affected at all, but if the power is turned off immediately after setting value(s) and/or state(s) is changed, the condition at the last power-off may not be able to be stored when the F741-C is started next time.

(1) As for key operations from the front panel, writing of setting values, calibration operation, digital zero operation, and tare subtraction are stored at any time without limitation.

(2) Tare subtraction by external input and automatically-performed zero tracking function are immediately stored at the first time after power-on, while they are stored upon elapse of 2 minutes after registration of changed values from the second time onward.

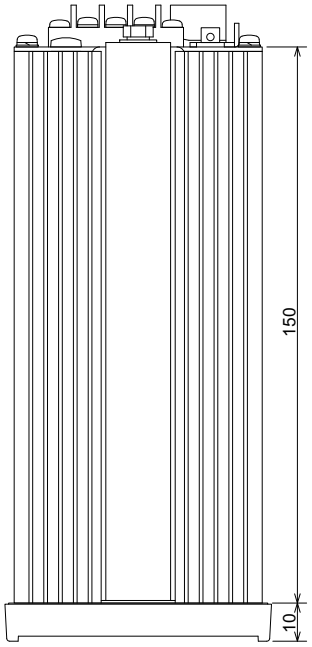
(3) Writing of setting values, calibration command, digital zero command, and tare subtraction command by RS-232C I/F and PROFIBUS I/F communication are immediately stored at the first time after power-on, while they are stored upon elapse of 2 minutes after registration of changed values from the second time onward.

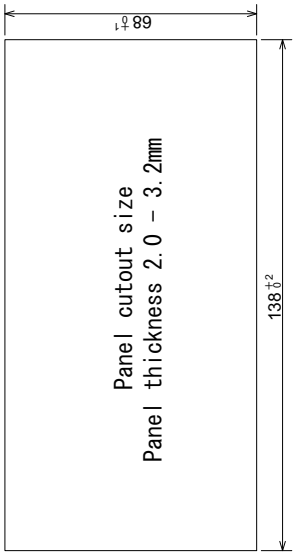
12. BLOCK DIAGRAM

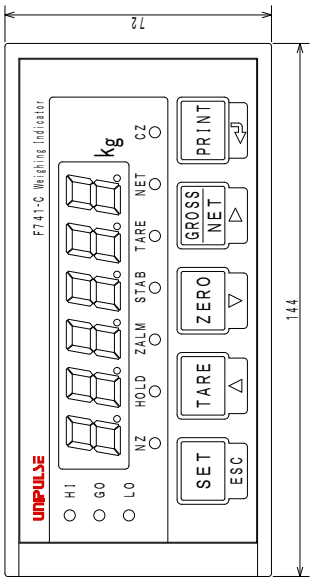


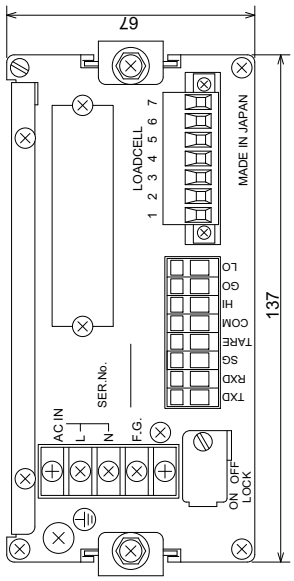
13. DIMENSIONS

13-1. Standard equipment

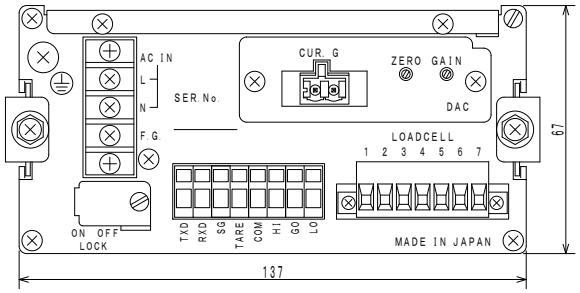


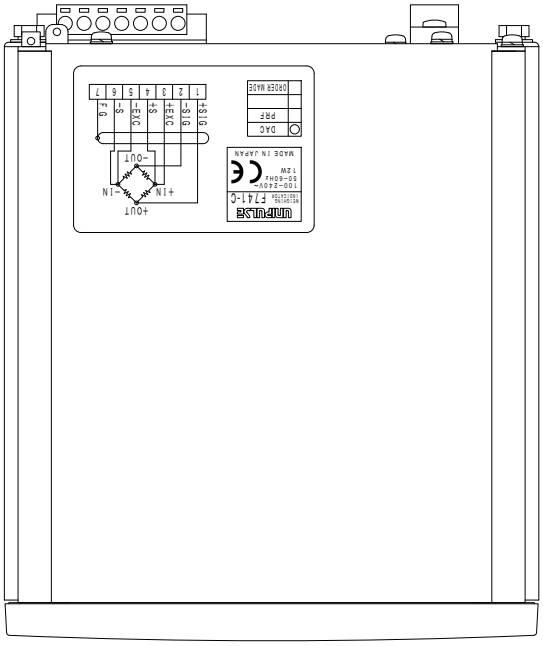


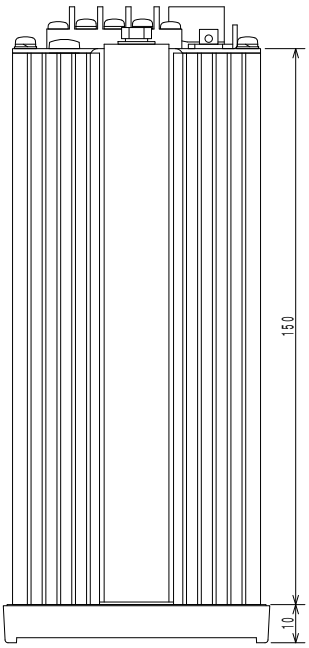


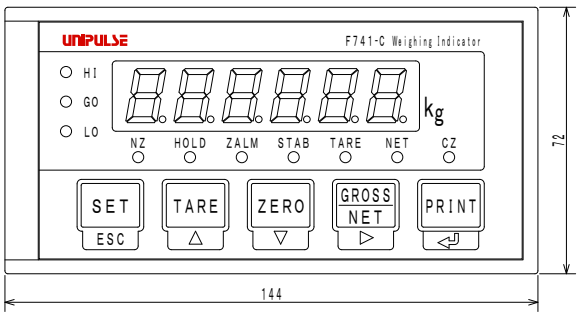


13-2. Dimensions (When the dac option is equipped)

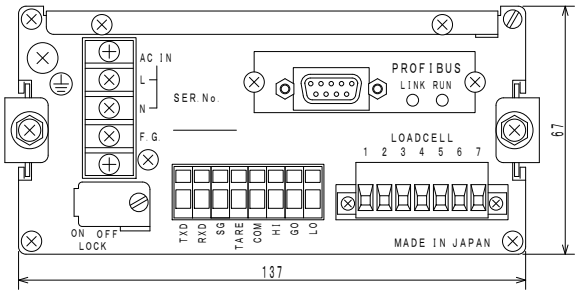


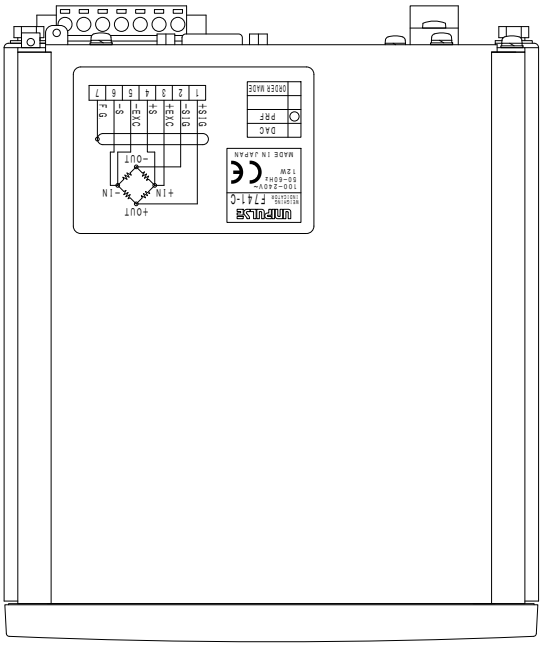


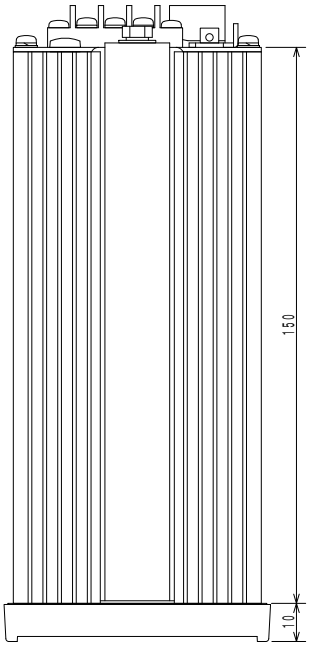


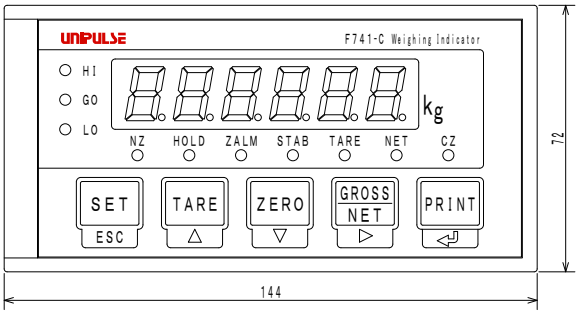


13-3. Dimensions (When the prf option is equipped)









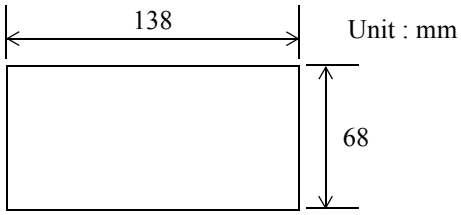
14. MOUNTING ON A PANEL

Please follow the procedure for mounting a panel to F741-C.

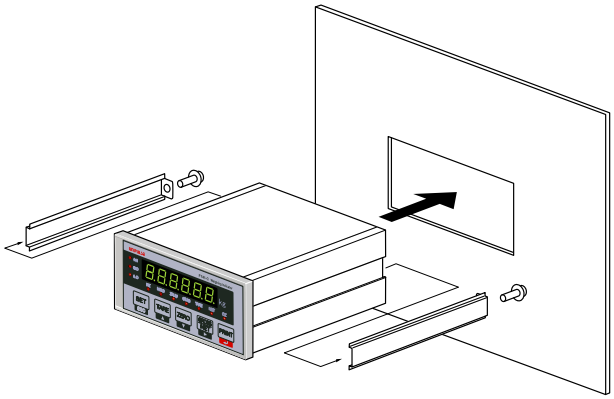
(1) Make a hole in the mounting panel.

Panel cutout size
138(W) × 68(H)(mm)

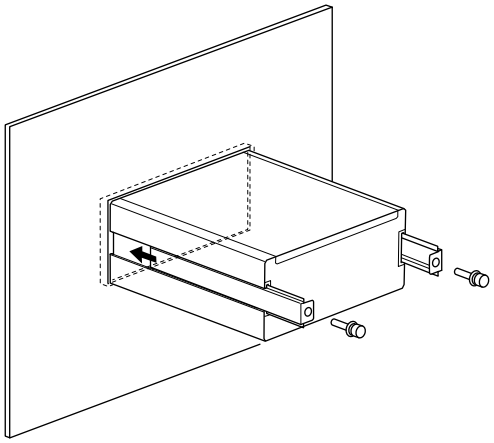
Mounting panel thickness
2.0 ~ 3.2 mm



(2) Remove the mounting rails on both sides of the indicator, and insert the indicator into the panel.



(3) Insert the mounting rails into both sides from the back of the indicator.



(4) Securely fix the mounting hardware on both sides with the attached M4 screws.

⚠ CAUTION

For transportation after panel-mounting, consideration should be given so as not to give excessive shocks or vibration.

15. SPECIFICATIONS

15-1. Analog section

Excitation voltage	DC 10 V ± 5 %	
	Output current:	within 120mA
	Remote sense type	
	(Up to four 350Ω load cells can be connected in parallel.)	
Signal input range	- 0.2 ~ 2.2 mV/V	
Zero adjustment range	0 ~ 2.0 mV/V	
	Automatic adjustment by digital operation	
Span adjustment range	0.3 ~ 2.0 mV/V	
	Automatic adjustment by digital operation	
Minimum input sensitivity	0.3 μV/count	
Accuracy	Non-linearity :	within 0.01%/FS
	Zero drift :	within 0.2 μV/℃ RTI
	Gain drift :	within 15ppm/℃
Analog filter	Bessel type low-pass filter (-12dB/oct)	
	Cutoff frequency 2Hz	
A/D converter	Conversion rate :	100 times/sec.
		(Internal sampling 3200 times/sec)
	Conversion resolution:	24 bits (binary)
	Effective resolution:	320000 or more
		(With respect to -0.2 ~ 2.2mV/V)
Minimum indication resolution	1/10000	
Secondary calibration	Equivalent input calibration	
	Minimum indication resolution for secondary calibration :	
	1/1000(ordinary temperature)	

15-2. Display section

Display	Numerical display tube;14mm in character height
	Numerical display by 7-segment green LED (6 digits)

Indicated value	6-digit, sign: negative display at the highest digit	
Display frequency	Select from 3, 6, 13 or 25 times/sec. (The system speed is 100 times/sec.)	
Unit	g, kg, t, lb, N, oz, and kN selectable (kg printed: Others are changed by the attached label.)	
Capacity	5 digit	
Min. Scale Division	Setting allowable in the range of 1 ~ 100.	
Decimal point	Select from 0, 0.0, 0.00 or 0.000 (Zero blanking display by decimal point position)	
Over display	A/D converter input over	LOAD
	Net Over	OFL1
	Capacity + 9 scale division	OFL2
	Gross Over	OFL3
Center zero	A true zero point or the center of each value is displayed.	
Status display	NZ / HOLD / ZALM / STAB / TARE / NET / CZ / HI / GO / LO / COMPL / SP2 / SP1	

15-3. Setting section

Setting method	Settings are made by operating the membrane keys. Also, settings can be made from a host computer through the RS-232C interface.
Memory of set values	NOV RAM (nonvolatile RAM)
Setting item	・Upper Limit Comparison mode : Upper Limit / Lower Limit / Hold time / Near Zero / Tare setting / Tare display ・Over/Under Comparison Mode : Target value / Over / Under / Hold time / Near Zero / Tare setting / Tare display ・Discharging control Mode : Final / Compensation / Set point 1 /Comparison Inhibit Time / Judging Time /Complete Output Time / Near Zero / Tare setting / Tare display

Password / Digital Filter / Motion Detection(Period) / Motion Detection(Range) / Zero Tracking(Period) / Zero Tracking(Range) / Weighing Function 1 / Weighing Function 2 / Function key invalid・LOCK / Balance Weight Value / Capacity / Min. Scale Division / DZ Regulation Value / Display Selection / Gravitational Acceleration / Equivalent input calibration / Zero Calibration / Span Calibration / RS-232C I/F / D/A Output Mode / D/A zero Output / Weight value / D/A Full Scale / PROFIBUS I/F / PROFIBUS Baud rate / Station No.

15-4. External input/output

Input signals(1point) TARE	ON when shorted with COM terminals by contact (relay, switch, etc.) or non-voltage-contact (transistor, TTL open-collector output, etc.)
Output signals(3points) HI / GO / LO (Can be changed to COMPL/SP2/SP1)	With short-circuit current limiting function by external power source.Transistor open collector output (Emitter = COM terminal) Output LO with transistor ON.

15-5. Interface

< Standard equipment >

・RS-232C communication interface [232]

Writing, changing, reading, etc., of weight data and various types of status, and additionally various setting values are carried out by commands from the host computer.

Signal level:	Based on RS-232C
Transmission distance:	Approx. 15m
Transmitting method:	Asynchronous
Transmitting speed:	1200, 2400, 4800, 9600, 19200 or 38400bps selectable
Bit configuration:	Star : 1bit Character length : 7 or 8bit selectable

	Stop	: 1 or 2bit selectable
	Parity	: None, Odd or Even selectable
Code:	ASCII	
Communication mode :	Command communication Automatic sending mode (6 patterns)	

< Option > (Number of options mountable: 1)

・D/A converter [DAC]

Weight values are output as converted to analog signals of current.
Zero output weight value and full scale weight value can be set.

Current output:	4 ~ 20mA
D/A conversion speed:	100 times/sec.
Resolution:	1/10000
Over range:	± 5% of the full scale Current : 3.2mA ~ 20.8mA
Zero drift:	Within 0.3 μ V/ ℃
Gain drift:	Within 30ppm/ ℃
Non-linearity:	Within 0.02%/FS ※Not including the drift of the analog input section

・PROFIBUS interface［PRF］

Connectable as a slave device to a PROFIBUS fieldbus.

Standard :	PROFIBUS-DP V0
Communication speed :	9.6 kbps - 12 Mbps supported (automatic follow-up)
Occupied memory:	OUT/12 bytes (6 words) IN/20 bytes (10 words)
Station No.:	0 - 125

※ Sync mode and freeze mode are supported.

※ Special clear mode (Fail safe mode) is not supported.

15-6. General performance

Power supply voltage	AC100 ~ 240V (+10%, -15%) [free power source 50/60Hz]		
Power consumption	Approx. 12W		
Rush current	18A,1.5mSec: 100V AC mean load state (ordinary temperature, at cold-start time) 42A,1.6mSec: 240V AC mean load state (ordinary temperature, at cold-start time)		
Operating conditions	Temperature:	Operation	-10 ~ +40 ℃
		Storage	-20 ~ +85 ℃
	Humidity:	85%RH or less	(non-condensing)
Dimension	144 (W) × 72(H) × 160(D) [mm] (※ Projections excluded)		
Panel cutout size	138W($^{+2}_{-0}$) × 68H($^{+1}_{-0}$) [mm]		
Weight	Approx. 1.0 [kg]		

15-7. Attachment

- AC input cord ※ 1(3m) 1
- Mini screwdriver for terminal block connection 1
- Unit and status indication label..... 1
- Jumper line..... 2
- Connector for D/A converter (with D/A converter option) 1
- Operation manual..... 1

※ 1 : The attached power cable is for 100V AC power in Japan.

About the power cable

- The power cable attached to this product as standard equipment can be used in the AC100V power supply in Japan. (Official ratings voltage AC125V)
  Please use the power cable authorized in the country when you use this product outside Japan.

- Our company sells following resistance pressure cable AC250V (European standard product) separately.
  Please purchase it from us when you need after confirming its plug shape/ voltage.

CAAC3P-CEE7/7-B2 : CEE7/7 Plug cable (2m)

16. THE LIST OF INITIAL SETTING VALUE

※ Initial value : Factory-shipped values.

※ LOCK 1 : Changing of setting values is inhibited by the software switch (Setting Value LOCK in setting mode 2-9)

※ LOCK 2 : Changing of setting values is inhibited by the software switch (Setting Value LOCK in setting mode 2-9)

※ LOCK SW : Changing of setting values is inhibited by the LOCK switch on the rear panel.

※ Display : Setting cannot be changed.

※ Page :Reference page number on which the details of each item are described.

16-1. Setting mode 1

•Upper/Lower Limit Comparison Mode

	Item	Initial value	LOCK 1	LOCK 2	LOCK SW	Display	Page
1	Upper limit	075.00	◎				P. 50
2	Lower limit	025.00	◎				P. 50
3	Hold time	3.0		◎			P. 50
4	Near zero	001.00	◎				P. 49
5	Tare setting	000.00	◎				P. 47
6	Tare display	000.00				◎	P. 48

•Over/Under Comparison Mode

	Item	Initial value	LOCK 1	LOCK 2	LOCK SW	Display	Page
1	Target value	100.00	◎				P. 52
2	Over	00.50	◎				P. 52
3	Under	00.25	◎				P. 52
4	Hold time	3.0		◎			P. 52
5	Near zero	001.00	◎				P. 49
6	Tare setting	000.00	◎				P. 46
7	Tare display	000.00				◎	P. 48

•Discharging control Mode

	Item	Initial value	LOCK 1	LOCK 2	LOCK SW	Display	Page
1	Final	100.00	◎				P. 55
2	Compensation	00.50	◎				P. 55
3	Set point 1	020.00	◎				P. 55
4	Comparison inhibit time	0.50		◎			P. 55
5	Judging time	1.5		◎			P. 55
6	Complete output time	3.0		◎			P. 55
7	Near zero	001.00	◎				P. 50
8	Tare setting	000.00	◎				P. 47
9	Tare display	000.00				◎	P. 48

16-2. Setting mode 2

	Item	Initial value	LOCK 1	LOCK 2	LOCK SW	Display	Page
1	Password	0000					P. 59
2	Digital filter	016		◎			P. 41
3	Motion detection (Period)	1.5		◎			P. 41
4	Motion detection (Range)	05		◎			P. 41
5	Zero tracking (Period)	0.0		◎			P. 44
6	Zero tracking (Range)	0000		◎			P. 44
7	Weighing function 1	03000		◎			P. 49 ～ P. 58 P. 73
8	Weighing function 2	0110		◎			P. 41,P. 47
9	Key invalid・LOCK	11100					P. 48,P. 59

16-3. Setting mode 3

	Item	Initial value	LOCK 1	LOCK 2	LOCK SW	Display	Page
1	Balance weight value	100.00		◎	◎		P. 34
2	Capacity	100.00		◎	◎		P. 34
3	Min. scale division	0.01		◎	◎		P. 34
4	DZ regulation value	02.00		◎	◎		P. 45
5	Display selection	2331		◎			P. 33,P. 34 P. 36,P. 40
6	Gravitational acceleration	9.8067		◎			P. 35
7	Equivalent Input calibration	2.0000		◎	◎		P. 40
8	Zero calibration	0		◎	◎		P. 37
9	Span calibration	100.00		◎	◎		P. 39

16-4. Setting mode 4

	Item	Initial value	LOCK 1	LOCK 2	LOCK SW	Display	Page
1	RS-232C I/F setting	30101		◎			P. 64
2	D/A output mode	00		◎			P. 77
3	d/a zero output weight	000.00		◎			P. 77
4	D/A full scale	100.00		◎			P. 78
5	PROFIBUS I/F setting	00		◎			P. 81
6	PROFIBUS baud rate	----				◎	P. 81
7	Station No.	125		◎			P. 81

※ The PROFIBUS baud rate displays an automatically-following baud rate only when communication is established. Without connection, －－－－ is displayed.

17.STATEMENT OF CONFORMATION TO EC DIRECTIVES

※ The F741-C is a CE-conforming product. Please follow the following instructions when you use it.

Unipulse F741-C weighing controller conforms to The EC Directives (based on Council of the European Communities), and is allowed to affix CE mark on it.

・Lower voltage directives EN61010-1

(Installation category II
Pollution degree 2)

・EMC directives EN61326-1

(EN55011, EN61000-4-2, EN61000-4-3, EN61000-4-4
EN61000-4-5, EN61000-4-6, EN61000-4-8
EN61000-4-11, EN61000-3-2, EN61000-3-3)

The following notice must be observed when you install F741-C unit.

1. Since F741-C is defined as an open type (unit to be fixed or built-in), it must be
   fixed or bolted to frame or solid board securely.

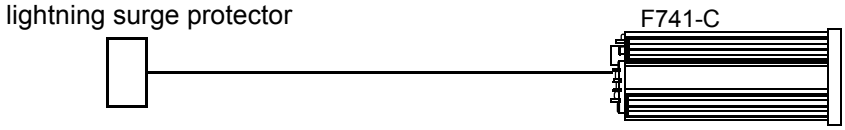
2. The power cable attached to this product as standard equipment can be used in the AC100V power supply in Japan. (Official ratings voltage AC125V)
   Please use the power cable authorized in the country when you use this product outside Japan.

3. Use shielded cable for connection with components other than power supply, such as load cell, input/output signals and optional device.

Notice

Combined use of F741-C and lightning surge protector conforms to EN61000-4-5 of EMC directives. (lightning surge immunity)

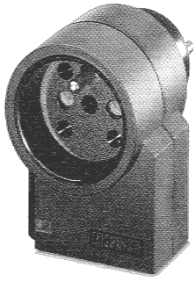
17-1. Connection of lightning serge protect



To take measures against lightning surge, install a lightning surge protector .

The F741-C main body conforms to EMC directive EN61000-4-5 (lightning surge immunity) in combination with the lightning surge protect.

● **Lightning surge protector［MAINTRAB MNT-1D］**

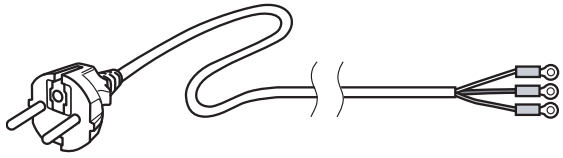


*“MAINTRAB MNT-1D” is trademark of Phoenix Contact, Germany

No lightning surge protector [MAINTRAB MNT-1D] is included as a standard.Please use the power cable authorized in the country when you use this product outside Japan. Before purchasing it, check the plug shape/voltage, which differs with countries and regions.

It is optionally available (TSU02) in combination with a 250V AC high-voltage cable in EU outlet form (See below: Standard product in Europe). For details, contact our sales department.

CAAC3P-CEE7/7-B2 ： CEE7/7 Plug cable(2m)



UNIPULSE

Unipulse Corporation
9-11 Nihonbashi Hisamatsucho, Chuo-ku, Tokyo 103-0005
Tel. +81-3-3639-6120 Fax: +81-3-3639-6130