F805AT-MD MULTI-DRAFT CONTROLLER

OPERATION MANUAL



Introduction

We appreciate your kind purchase of F805AT-MD Multi-draft Controller. To take full advantage of high performance of F805AT-MD, 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 F805AT-MD should be performed by personnel having technical knowledge of electricity.

In order to have an F805AT-MD used safely, notes I would like you to surely follow divide into

" MARNING " and " A CAUTION ", and are indicated by the following documents. Notes indicated here are the serious contents related to safely. Please use F805AT-MD after understanding the contents well.

M 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.



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 F805AT-MD becomes faulty or malfunctions, provide a safety circuit outside the F805AT-MD.
- Before using the F805AT-MD 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 F805AT-MD. 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.
- The connection to the RS-485 terminal block must use the crimp contacts. Do not connect it the open-wire line.
- After wiring, be sure to mount the attached terminal block cover. Otherwise, it may cause an electric shock. (at the DC spec.)
- 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

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

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.
- Lithium battery use in the F805AT-MD unit.

type: CR14250SE manufactured by Sanyo Electric, or equivalent

Voltage: 3 volts Capacity: 850 mAh

⚠ 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 F805AT-MD as it is incorporated in a control panel, etc.
- Do not install in the following environments:
 - Locations where temperature or humidity exceeds specifications;
 - Locations subjected to drastic temperature fluctuations or icing and condensing;
 - Outdoors or locations above 2,000m;
 - Locations exposed to direct sunlight;
 - Locations subject to dust accumulation;
 - Locations with poor ventilation;
 - Locations with a lot of salt and metal powder;
 - Locations where the main unit is subject to direct vibration and shock.
- 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 F805AT-MD 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

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

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 (at the DC spec.)
- For sensors, external inputs/outputs and options, use shielded cables.
- The temporary overvoltage applied to the power should not exceed 1500V.

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 F805AT-MD for at least 30 minutes or more before
 use.
- If the F805AT-MD 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 F805AT-MD. 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 F805AT-MD 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 F805AT-MD 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.

About the power cable



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

The power cable attached is an object for checking of operations.
 Please use the power cable authorized in the country for employment.

Product compliant to RoHS2 Directive

The parts and attachments (including the instruction manual, packaging box, etc.) used for this unit are compliant with the RoHS2 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 RoHS2 Directive of the option.

RoHS2 Directive

It is based on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE). The Directive restricts the use of specific substances in electrical and electronic equipments that could harm environment and human body. The substances are lead, mercury, cadium, hexavalent chromium, PBB (polybrominated biphenyls), PBDE (polybrominated diphenyl ethers), DEHP (bis(2-ethylhexyl) phthalate), BBP (benzyl butyl phthalate), DBP (dibutyl phthalate), and DIBP (diisobutyl phthalate).

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1.FEATURES

1-1. Features in General

F805AT-MD multi-draft controller is designed for quick and accurate weight control of material. Use of F805AT-MD is not limited to packaging line but can be of help to your production wherever high speed and accurate weight control is vital.

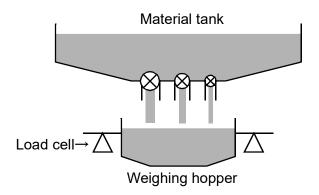
During the course of weigh/feed process, from material loading up to discharge from hopper, easy setting of many control parameters through touch screen makes F805AT-MD to serve your individual need efficiently.

The discharged quantities are accumulated by external input or auto accumulation. Large quantity can be discharged more accurately by combining with the control setting of Total final, Total SP1, SP0 and Over/Under judging.

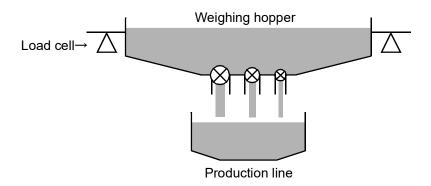
1-1-1. Feed weighing and discharge weighing

Two types of weigh and control of material quantity, i.e. "Feed weighing" and "Discharge weighing" are used by F805AT-MD.

Feed weighing......to weigh and control quantity of material being loaded from material tank into weighing hopper with load cell device.



Discharge weighing....to weigh and control quantity of material being discharged from weighing hopper to production line..

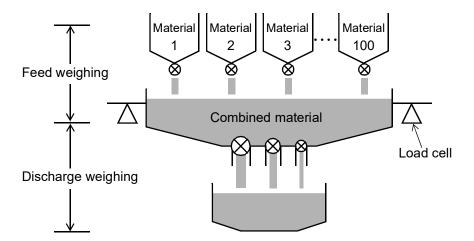


1-1-2. Combined use of feed / discharge weighing

Feed weighing and Discharge weighing can be switched over each other during weighing process. Such switching can be made either through touch screen or by a signal from control connector on rear panel of the unit.

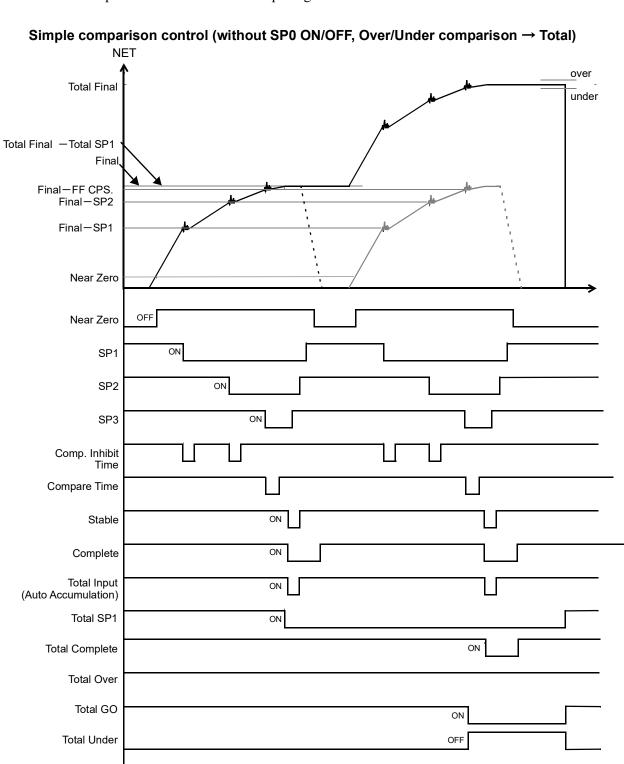
Taking advantage of the switching over function between them, F805AT-MD controls feeding predetermined quantity of different ingredient from bin and formulate a batch of material blend in weighing hopper. F805AT-MD can store even 100 sets of ingredient formula. Thus, versatility of F805AT-MD is widely enhanced. (See sketch below)

Multi-ingredient batching



1-2. Type of Control to Obtain Constant Weight

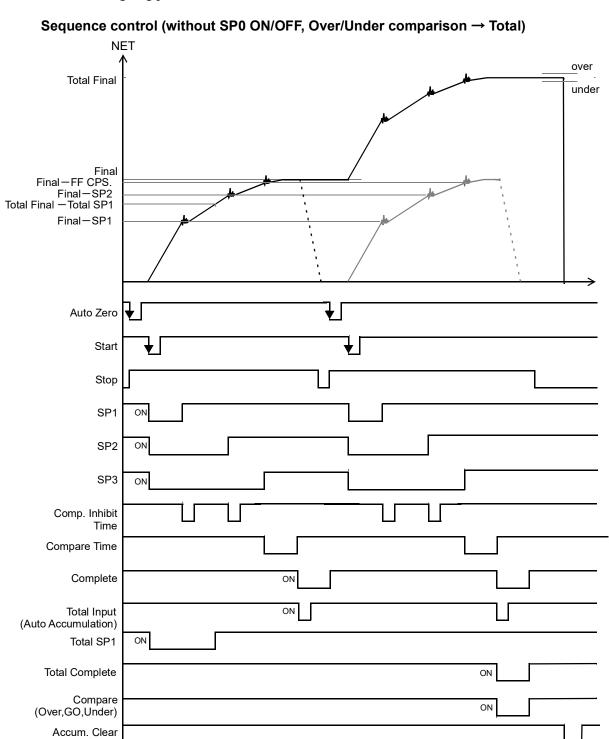
a) "Simple Comparison" is a "weight differential detection" type control. Control procedure is shown below. It is a controlling method that to compare on-weighing value and the set target weight parameter constantly. When weighing value reaches to one of the set parameters then relevant output signal turns on.



Accum. Clear

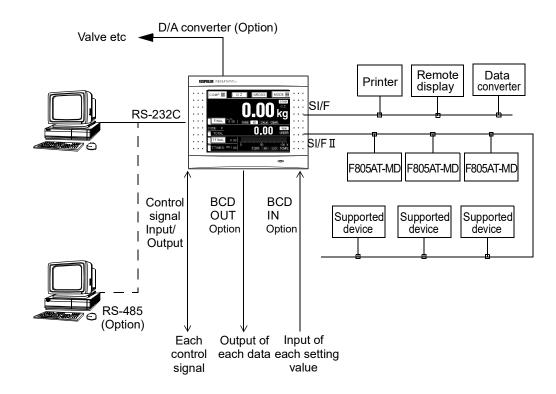
b) "Sequential Control" cycle begins by "start" signal input and completes weighing procedure by self-contained sequence program. Such "start" signal may be input by Control I/O or pressing Start tag on touch screen. With the signal, weighing sequence SP1,SP2 and SP3 turns on simultaneously. When the weight reaches to respective pre-set value, relevant signal turns off sequentially.

In "Sequence Control" operation, F805AT-MD performs PLC function to control all weighing process.



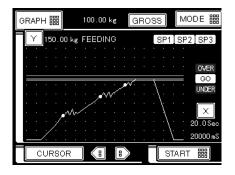
1-3. Interfaces of Weighing Controller

In order to strengthen serviceability, F805AT-MD can communicate with variety of peripheral equipment through standard or optional interface module. Sketch below shows example of such interfacing.



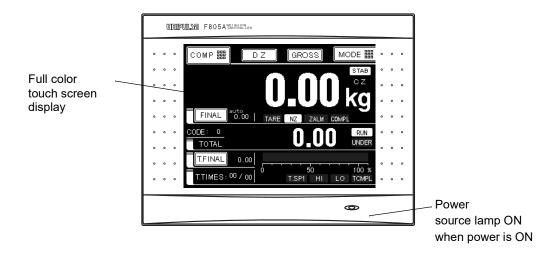
1-4. Graphic

Input signal can be shown in wave form on "Graphic Display Mode Screen" on front panel. It will give you instantaneous visual perception of on-going procedure, and give you important information for production control. For further information, refer to page 98 of this manual.



2. APPEARANCE DESCRIPTION

2-1. Front Panel



Full color-touch screen-graphic display

The panel-mount configuration offers maximum mounting flexibility. There are three different display screens during systems operation, 12 screens for selection, 112 screens for setting items and few hundred screens for setting value or performance.

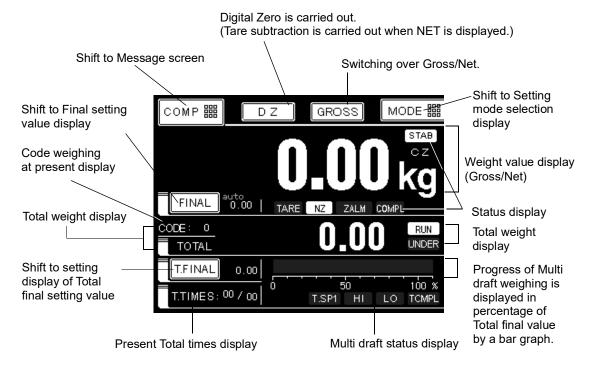
COMP, MESSAGE, GRAPH:

COMP, MESSAGE and GRAPH are the three different display screens. The meter will display which screen you are (COMP, MESSAGE, GRAPH), to change the screen press the button on the upper left-hand corner.

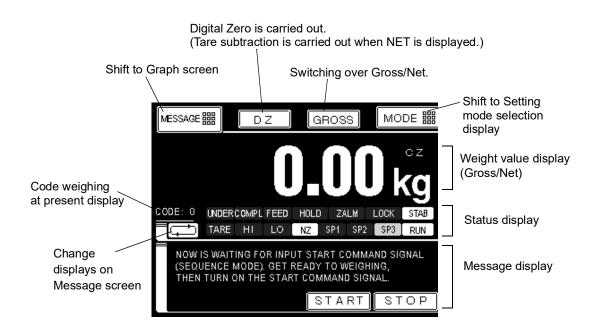
MODE, BACK:

To change setting value, or select setting items, from any screen goes back to display screen by pressing (MODE, BACK) button on the upper right-hand corner.

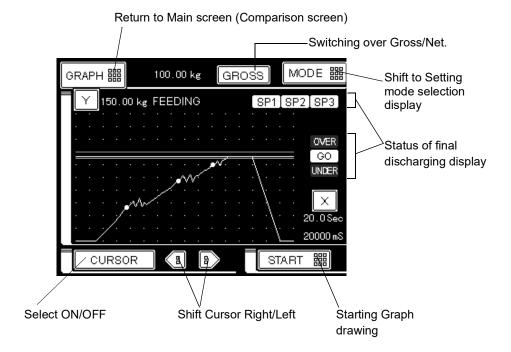
[Comparison screen]



[Message screen]



[Graph screen]



Weighing value display

- Weighing value Gross/ Net selectable, Minus sign, Center zero, Overload and Errors.
- 1/4 scale division When setting 1/4 scale division is ON, either CZ, ▼ or ▲ is displayed.
- Unit Displays the unit already set in unit setting.

Total weight display

• Weight value Total value is displayed

Status display / Status of Total weight display

· OVER/ GO/ UNDER

After each weighing circle, when the result is within the set tolerance range of Final, GO highlights for orange; or OVER highlights for blue or UNDER highlights for red.

Weight compared is depending on the setting in Over/Under comparison or weighing comparison.

- COMPL During Complete signal is ON, COMPL highlights for sky blue.
- FEED/ DCHG....... Either displays FEED or DCHG in the feed weighing or discharge weighing of the Simple Comparison Control.

 In Sequence Control, during Discharge gate control is ON, DCHG highlights for yellow; during the Discharge output signal is ON blinks during waiting for Discharging Command.
- HOLD HOLD highlights for yellow during weight value is held.
- ZALM......Press DZ tag, bring the Gross weight to zero, if the value is exceeded the range of set Digital Zero Regulation, ZALM highlights for red.
- STAB STAB highlights for green during weighing value is stable.

 The condition of stable varies with MD setting value.
- TARE......STAB highlights for green during weighing value is stable.

 The condition of stable varies with MD setting value.

- SP1, SP2, SP3....... SP1 in sky blue color when SP1 output signal turns ON.

 SP2 in yellow color when SP2 output signal turns ON.

 SP3 in orange color when SP3 output signal turns ON.

 SP1,SP2 and SP3 blink during waiting for starting sequence control.
- RUN in sky blue during normal operation.
- T. SP1 Total SP1 in sky blue during Total SP1 signal is outputting.
- TCMPLTCMPL in Blue during Total complete signal is outputting.

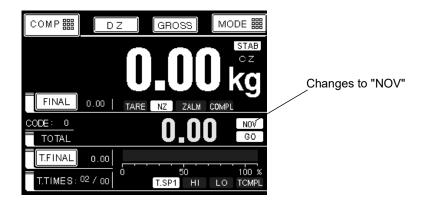
Message display

- Error messageShow the detail error message of Calibration or Overload.
- Sequence status......Show the present status of sequence control.

 To start or stop sequence control, push START or STOP tag
 in Message display or trigger Start / Stop control I/O on the
 rear panel.

Update setting value

During update the Setting value to the memory (NOV. RAM), instead of RUN shows NOV. Please make sure do not disconnected power when NOV is showing.

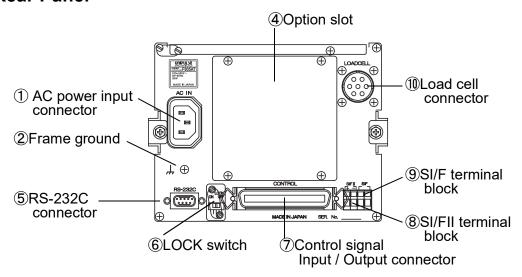


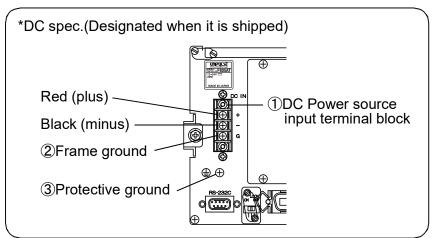
2-1-1. Power source lamp

Power Source lamp lights up when power of F805AT-MD is ON.

Power source lamp keeps lighting up as long as the power is ON even when display is disappeared in sleeping state.

2-2. Rear Panel





① AC power source input connector/ DC power source input terminal block

AC spec.

Connect with AC power source cable supplied.

Input voltage is $AC100V\sim240V$ (+10% -15%), and frequency is 50/60Hz.

DC spec. (Designated when it is shipped.)

Connect DC power source. Voltage input is DC12~24V (±15%).

② Frame ground ____

Please ground the frame ground terminal to prevent failures due to static electricity. It may be better to remove depending on the environment of the installation location.

3 Protective ground (L.) (DC spec. only)

Be sure to ground the protective ground terminal to prevent electric shocks.

4 Option slot

Up to 4 option boards can be installed.

- BCD Parallel data output
- · BCD Parallel data input
- · D/A Converter
- · RS-485

⑤ RS-232 connector

RS-232 connector for receiving and transmitting weight data, status information and so on. The adaptable plug is OMRON XM3D-0921 (Cover: XM2S-0913 with #4-40 screw) or its equivalent.

6 LOCK switch

Lock switch is for disabling changes in calibration and setting values. While switch is ON could not do calibration.

7 Control signal Input/ Output connector

Connector for performing control signal input and output. The adaptable plug is DDK 57-30500 (attached to the F805AT-MD) or its equivalent.

8 SI/FII terminal block

Higher speed bi-direction 2-wire serial interface is a network solution for connecting weighing controllers, converters, printer and remote displays up to 20 devices.

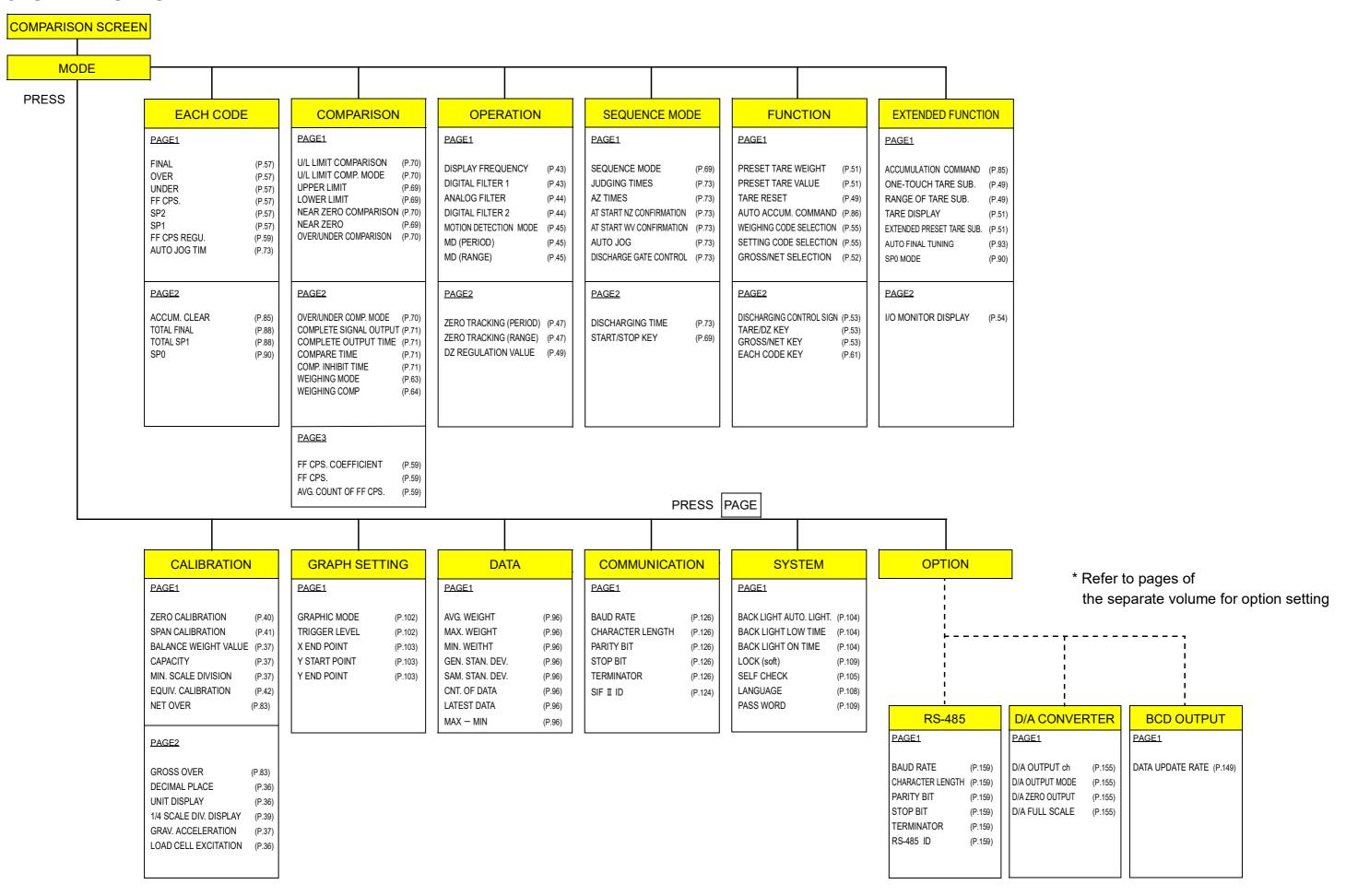
SI/F terminal block

2-wire Serial interface is to connect Unipulse peripheral equipment such as printer, remote display.

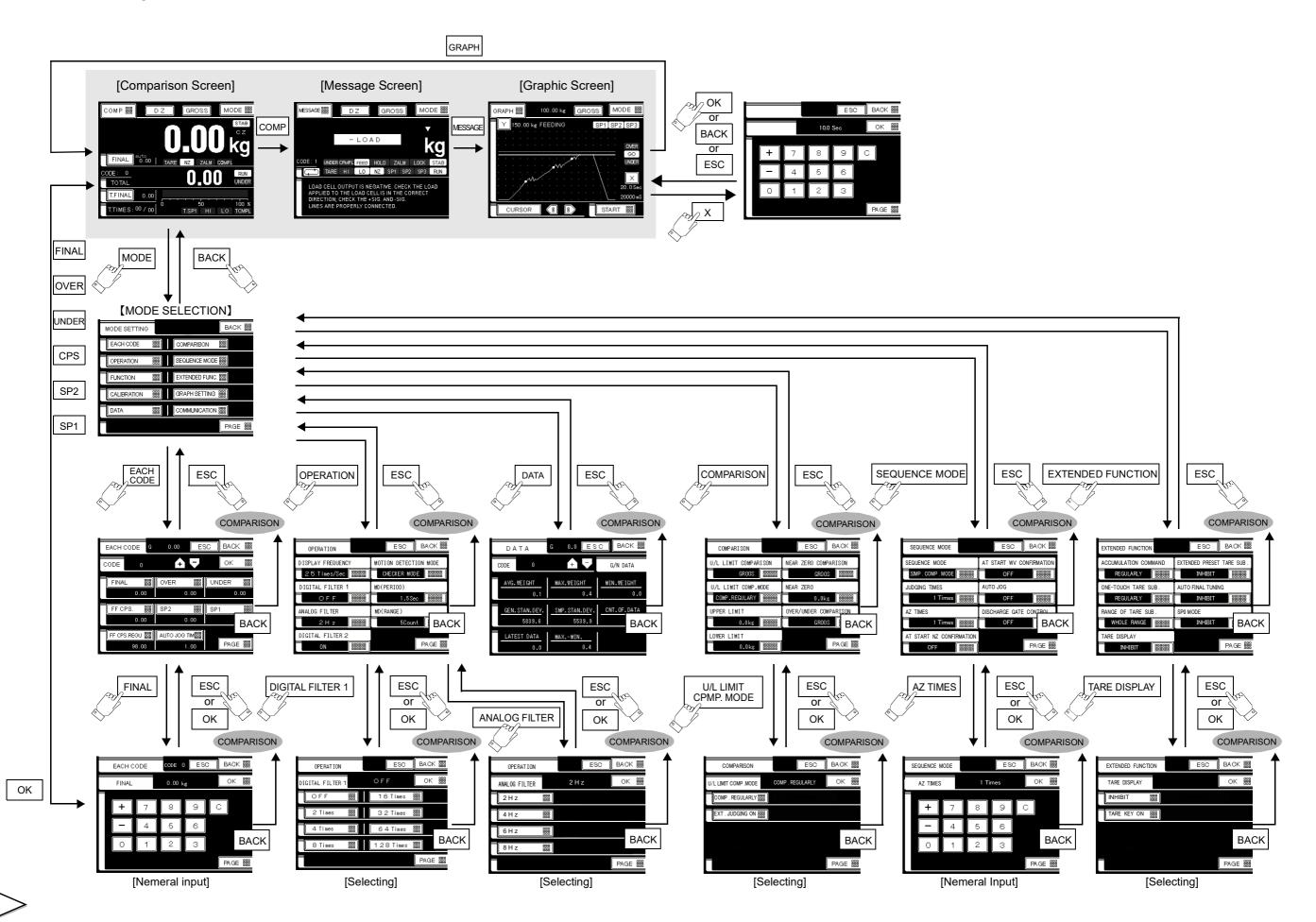
1 Load cell connector

7-pin round connector for 6-wire connection with load cells, adaptable plug is Hirose JR16PN-7S or its equivalent.

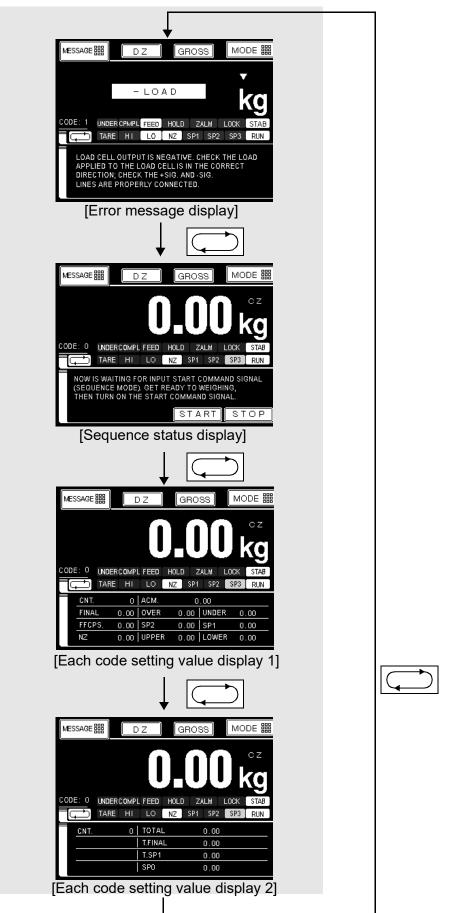
3. SETTING MODE CHART



3-1. Screen Composition



3-2. Message Screen

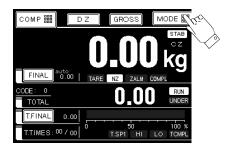


3-3. The Way of Setting

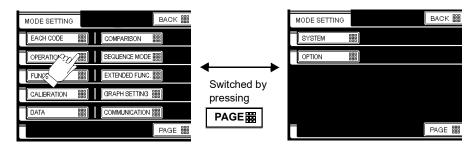
3-3-1. Selecting analog filter

Vibration in the process control not only causes fluctuating weight display, but also inaccurate batch weights. The motors, mixers, blenders, screw feeders and vibrators are necessary parts to any automation weighing systems but each can introduce a unique vibratory force to the scale. To adjust analog filter to suit to the weighing systems improves batch quality, speed up the processing and eliminates wasted materials.

1) Press MODE III button.

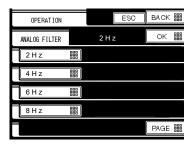


2) Select the **OPERATION** button.



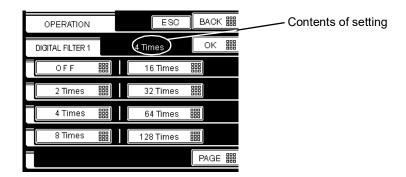
3) Select the "Analog Filter", choose the analog filter within 2 Hz, 4 Hz, 6 Hz or 8 Hz. The lower frequency is for killing strong vibration, to make the best choice to your system please.

Press OK III , continues to choose other setting items in "OPERATION" category.



4) Press **BACK** , returning to Comparison Screen.

3-3-2. Selecting digital filter



- 1) Press MODE button.
- 2) Select the "OPERATION" tag.
- 3) Select the "Digital Filter 1" button and enter in your desired times. Press ok
 and you will be back in the operation menu.

The higher times Digital Filter causes lower response.

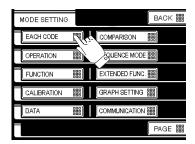
4) Press **BACK** iii button returning to Comparison Screen.

3-3-3. Setting each code

1) Press MODE ## button.



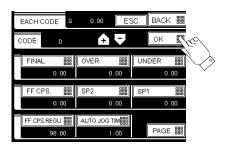
2) Select the "EACH CODE" tag.



3) It shifts to Each Code setting display. Select a code if necessary.

Select a code by pressing + key.

Press OK III for registration.





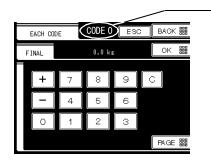
During Code selection, Code figure turns to red.

When registration is finished by pressing oκ ∰, Code figure turns to green.

Setting Items on the screen [from FINAL to ACCUM. CLEAR (Accumulation value)] are concerned with the Code figure that highlights in green.

4) Shifts to the Final setting screen by pushing "Final" tag.

Input Final value by ten keys, press \overline{OK} \cong for registration.



The registered Final value is belong to the code number which shows on the top of screen



Select a Code number by pressing \bigoplus key, as described in 3) called "Key input" method; then select a Code number via Control I / O on the rear panel called "External input".

All setting items from FINAL to SP0(a) correspond to "Setting Code" on the screen of Setting Each Code.

While performing Setting Code Selection through External input, it can only be set (a) on Code No. selected by external input because External input is prior to Key input in this situation.

To the contrary while performing Key input of Setting Code Selection it only enables to set (a) on Code No. selected through Key input because Key input is prior to External input.

When Setting (a), check the Code No. on the Setting screen before starting the operation.

4. WAY OF CONNECTION

Precautions about connection to the signal input/output terminal block 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.
- After wiring, be sure to mount the attached terminal block cover. Otherwise, it
 may cause an electric shock.(Power input terminal at the DC Spec. or RS-485
 terminal block.)
- 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.

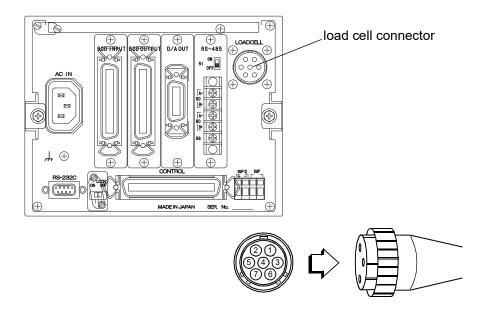
CAUTION

- Tighten the terminal screws at the specified torque. If they are loose, shorts, fire or malfunctions may occur. Tightening torque: 0.5N•m(Power input terminal at the DC Spec. or RS-485 terminal block.)
- Use shielded cables.

4-1. Load Cell Connection

The excitation voltage of the F805AT-MD is 10V DC/5V DC selectable at 120 mA. Up to 4 load cells (350 ohm) may be connected in parallel (when excitation is 10V). A 7-pin (Hirose JR16PN-7S) round connector is supplied.

* Refer to p36 for "5-4-2".

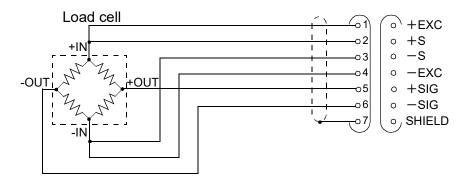


Pin No.	Signal (6-wire)	Signal (4-wire)
1	+ EXC	+ EXC
2	+ S	(connect 1 to 2)
3	- s	- EXC
4	- EXC	(connect 3 to 4)
		,
5	+ SIG	+ SIG
5	+ SIG - SIG	,

4-1-1. 6-Wire connection

The load cell input of the F805AT-MD is a 6-wire (remote sense) connection.

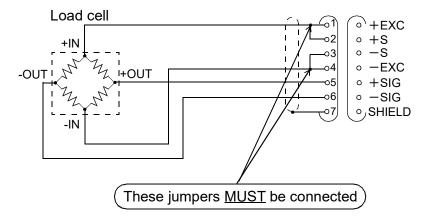
6-wire shielded load cell cable should be used and kept separate from AC or other noise generating wire.



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

4-1-2. 4-Wire connection

Jumper the sense lines to the Excitation lines (pin 1 to 2, pin 3 to 4) in a 4-wire system (shown below). Failure to comply may result in system damage.



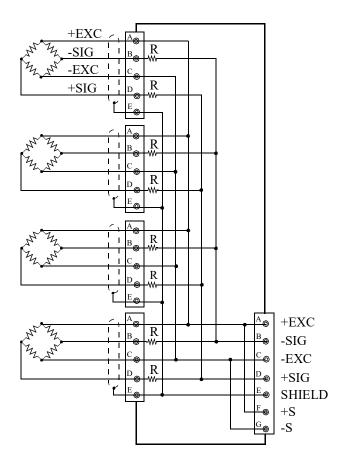
▲ CAUTION

- The F805AT-MD 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.
- The F805AT-MD 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.
- The load cell excitation voltage of the F805AT-MD is 5V or 10V. Heating or breakage may occur unless the load cells maximum excitation voltage is the load cell excitation voltage of the F805AT-MD or more.
- When using the F805AT-MD 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.

4-1-3. Connecting load cells in parallel

Some industrial applications require several load cells connected in parallel (e.g., tank or flow scales).

A summing junction box should be used to facilitate connection and corner correction.



'n' (number) load cells connected in parallel are considered <u>one</u> unit whose capacity is 'n' x rated capacity of load cells (load cells must have the same capacity, bridge resistance, and mV/V). The averaging resistor (R) must be in same relative ratios with a low temperature coefficient.

Averaging resistors are not needed if load cells were designed for parallel connection.



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

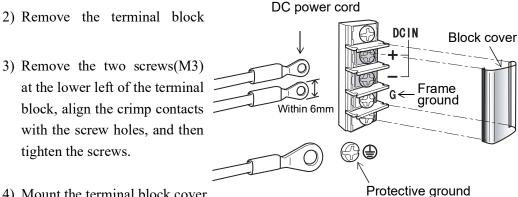
4-1-4. Sensor cable

Cable colors of sensors may differ from one manufacturer to another (it may even differ from one model to another for some products). Refer to the sensor manual (or data sheet) and check signal names and colors in order to connect the cables correctly.

4-2. Connecting power input terminal at the DC Spec.

Connect the DC power cord. The input voltage is 12V to 24V DC.

1) Make sure that no power is applied.



- 4) Mount the terminal block cover.
- 5) Remove the screws(M4) of the protective ground, align the crimp contacts with the screw holes, and then tighten the screws.

4-3. Connection of the protective ground

The grounding terminal is for prevention of electric shocks. Use an approx. 0.75mm² 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. For use at voltages exceeding the rating and for overseas use, have a separate AC cable prepared.
- Since the F805AT-MD has no power switch, install a breaker.
- Be sure to ground the protective ground terminal to prevent electric shocks. 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).

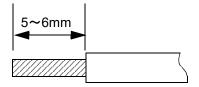
4-4. SI/F 2-wire Serial Interface

This 2-wire serial interface is for connecting F805AT-MD to peripheral equipment such as printers or remote displays. No polarity is needed for this simple, low-cost installation.

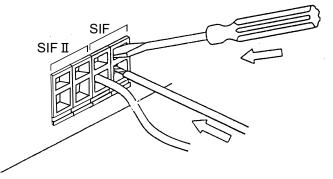
The transmitting distance is about 300m (328yds).

The Lock, SI/F. terminal on the rear panel is a Cage Clamp. Connection is simple and easy.

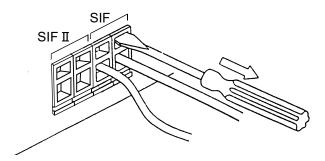
- (1) Strip the casing 6mm (0.2 inch) on the cable to be connected.
- (2) Twist the bare wire to fit the terminal hole.



- (3) Insert the supplied screwdriver into the upper hole and lift upward.
- (4) Insert the twisted wires into the lower hole.



- (5) Pull the screwdriver out from the upper hole.
- (6) Make sure cable is clamped securely and does not come out with a slight tug.





- Cable can be from 24 to 14AWG (0.2 to 2.5mm²). Do not solder the cable wires or fix a solderless terminal.
- If several cables to be inserted to the same hole, twist those cable wires together and insert

4-5. SI/FII High Speed Bi-directional 2- Wire Serial Interface

SI/FII is a high speed bi-directional serial interface for connecting F805AT-MD to various peripheral Devices. These include printers, remote displays, converters (D/A, BCD-IN, BCD-OUT, RS-232C).

Up to 20 devices may be connected by 2-core parallel or shielded cable with polarity.



4-6. Control Connector-pin Assignment

The input/output circuits are opto-isolated from the internal circuitry.

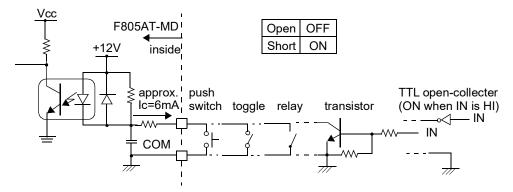
DDK 57-30500 plug is included

1	*	COM	26	*	COM
2	in	G/N	27	in	Start *1
3	in	D/Z ON	28	in	Stop *2
4	in	Tare ON	29	in	Discharging Command *3
5	in	Tare OFF	30	in	Compulsory Discharging Command*4
6	in	Hold or Judge	31	in	Open Discharge Gate *5
7	in	Feed / Discharge	32	in	Close Discharge Gate *6
8	in	Accumulation Command	33	in	Code No.Designation Selection
9	in	Total Clear	34	in	Accumulation Clear
10	*	COM	35	*	COM
11	in	Code No. Designation 1	36	in	Code No. Designation 10
12	in	Code No. Designation 2	37	in	Code No. Designation 20
13	in	Code No. Designation 4	38	in	Code No. Designation 40
14	in	Code No. Designation 8	39	in	Code No. Designation 80
15	*	COM	40	*	COM
16	*	COM	41	*	COM
17	out	Near Zero	42	out	Discharge *7
18	out	SP1	43	out	Lower Limit
19	out	SP2	44	out	Upper Limit
20	out	SP3	45	out	Stable
21	out	Complete	46	out	Weight Error
22	out	Under	47	out	Total complete
23	out	Over	48	out	Final / Sequence Error *8
24	out	Total SP1	49	out	Run
25	*	COM	50	*	COM

- The COM (common) terminals are connected inside.
- The power voltage is not outputted.
- *1 to *8 are effective in the Sequence Mode.

4-6-1. Equivalent circuit (input)

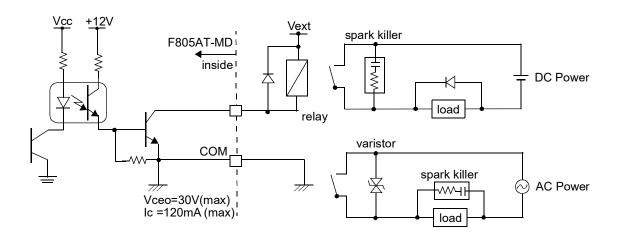
Signal are inputted by shorting or opening input and COM terminals. A relay, switch or transisitor may be used for this application.



- Do not apply external voltage to the signal input circuit.
- Use external elements which withstand Ic=10mA.
- Leakage of external elements must be within 100μA.

4-6-2. Equivalent circuit (output)

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



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 spark killer to the relay circuit as shown in the draft so that to reduce noise trouble and extend the life of relay.

4-7. RS-232C Interface

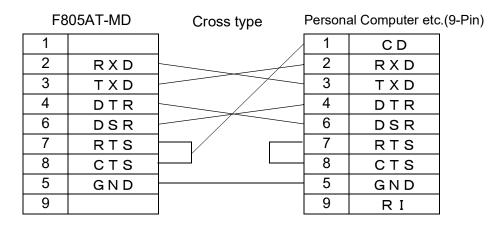
4-7-1. Connector pin assignment

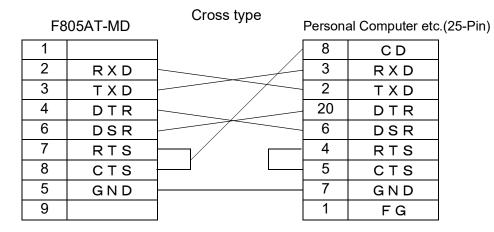
Adaptable plug: 9-pin D-SUB connector

* OMRON XM3D-0921 (Cover: XM2S-0913 with #4-40 screw) or its equivalent

1			6	in	DSR
2	in	RXD	7	out	RTS
3	out	TXD	8	in	CTS
4	out	DTR	9		
5	*	GND			

4-7-2. Cable





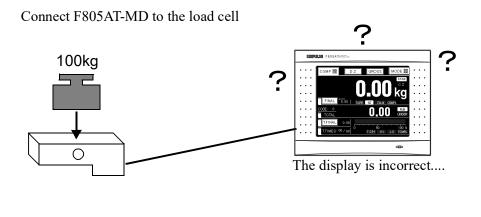
The above diagram is for connecting a personal computer as a DTE (Data Terminal Equipment) device. If it is a DCE (Data Circuit-terminating Equipment) device, connect pin to pin (DTR to DTR, DSR to DSR etc.).

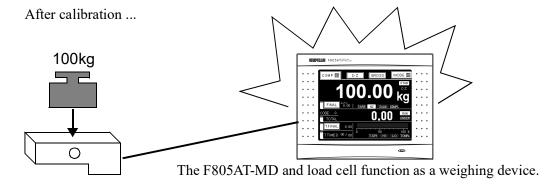
Cables should be prepared after checking connector type and pin assignments of the connected device.

5. CALIBRATION

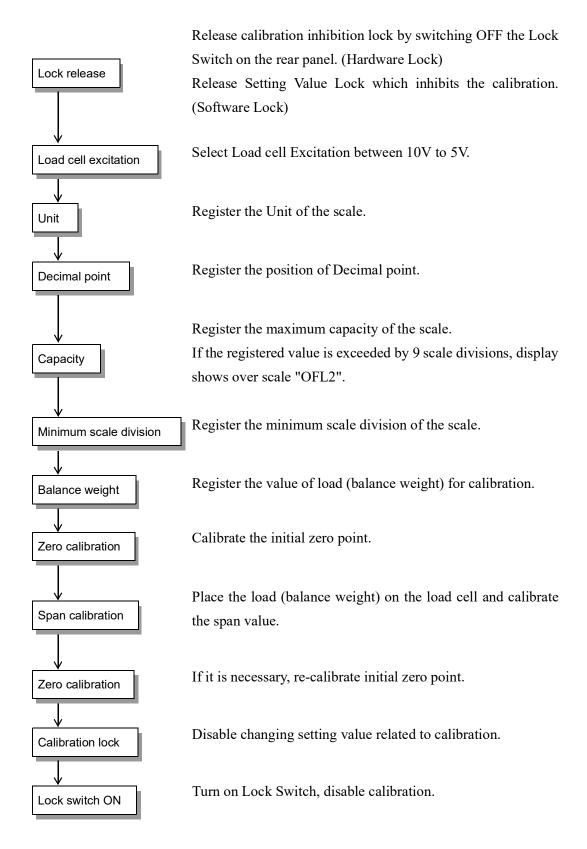
5-1. What is Span Calibration

Span Calibration means putting a load (test weight) on the load cell (or scale) and calibrating so the F805AT-MD indicates the correct weight.





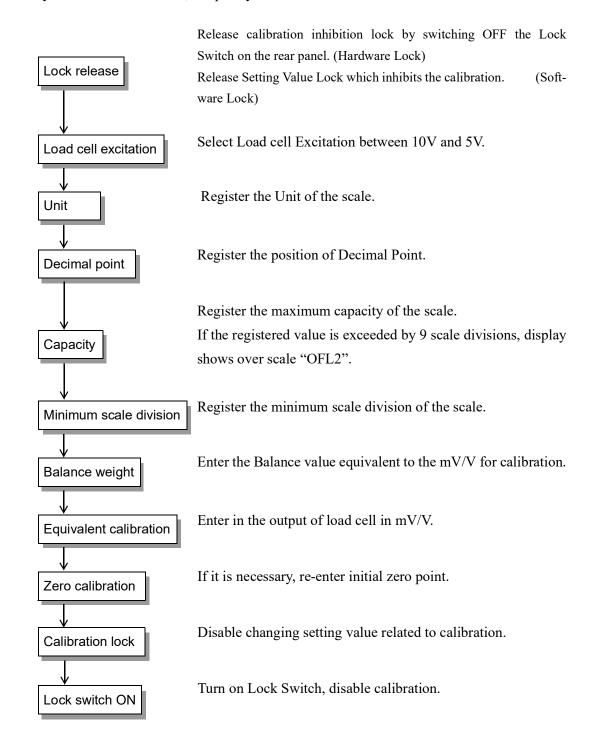
5-2. Calibration Procedure



5-3. Secondary Calibration Procedure (Equivalent Calibration)

Equivalent calibration by entering the Output (in mV/V) of the load cell to calibrate the instrument.

The equivalent calibration function is not available for NTEP. Due to the replacement of weighing controller provides against an emergency or miss-operation Span calibration, and no chance to do actual load calibration, but have to continually operate the weighing system. It is a convenient, temporary measure.



Notice

The set Balance weight must be equal or less than the set Capacity.

When use the rated load cell mV/V for equivalent calibration, the Capacity must be equal to load cell capacity.

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 mV/V value to perform accurate calibration.

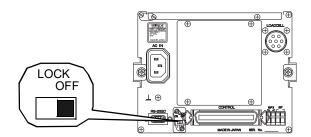
5-4. Do Calibration

5-4-1. LOCK release

The F805AT-MD features a Lock function for disabling changes in calibration and setting values.

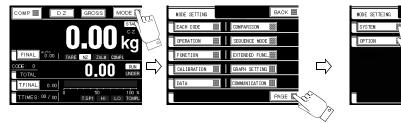
The Software Lock is in the configuration of SYSTEM and perform on the Comparison Screen, the Hardware Lock switch is located on rear panel. Release both of Locks before starting calibration.

1) Set lock switch to OFF.

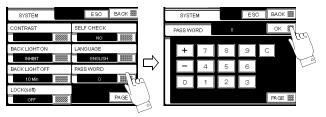


2) Press the MODE button, then PEGE

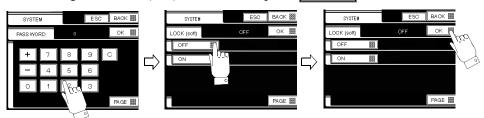
3) Select the "SYSTEM" tag.



4) Press the "PASS WORD" tag, input "1269" then press OK 🔛 .



5) Press the tag of "LOCK (soft)", then "OFF" press OK



6) Press BACK III , go back to comparison screen.

5-4-2. Load cell excitation

Select load cell excitation between 10V and 5V.

Refer to the specification of load cell to select suitable excitation please.

- 1) Press MODE button.
- 2) Select the "CALIBTATION" tag.
- 3) Press PEGE iii button.
- 4) Select the "LOADCELL EXCITATION" tag, press 10V or 5V tag then OK 🗒 .

5-4-3. Unit

The unit can select from t, kg, g, N, lb or None unit.

Operation

Press MODE → CALIBRATION → PAGE → UNIT DISPLAY → Select Unit → OK

5-4-4. Decimal place

Decimal place should be selected from 0/0.0/0.00/0.000.

Operation

Press

MODE → CALIBRATION → PAGE → DECIMAL PLACE → Select D.Place 0/ 0.0 / 0.00 / 0.000 → OK



All of the decimal place in F805AT-MD are fixed except for weight.

* They cannot be changed.

5-4-5. Capacity

Register the capacity of the scale. The capacity must be within the rated load of load cells combined. The input range of capacity is between 0 to 99999.

Operation

Press MODE → CALIBRATION → CAPACITY → Input Capacity 0~99999 → OK

5-4-6. Minimum scale division

The minimum scale division can be from 001 to 100. The display resolution obtains from dividing minimum scale division by capacity.

Operation

Press MODE → CALIBRATION → MIN.SCALE DIVISION → Input Min.Scale Div 1~100 → OK

The display resolution ignores the decimal place.

For example: When minimum scale division is 001 then

if capacity is 10.000, the display resolution is 1/10000;

if capacity is 100.00, the display resolution is 1/10000;

if capacity is 40.000, the display resolution is 1/40000.

5-4-7. Balance weight

The load value (Balance weight) that is applied to the scale for calibration. The input range of Balance is between 0 to 99999.

Operation

Press MODE → CALIBRATION → BALANCE WEIGHT → Input Balance. Weight 0~99999 → OK

5-4-8. Gravitational acceleration

Slight error may occur if the scale moved from the location of calibration due to gravitational changes. If the scale is used in the location of calibration, this function is not necessary. But after calibration the scale will ship to different location, before Span calibration do operation procedure as follows.

- Select GRAV. ACCELERATION, input relative number to located Gravitational Acceleration.
- · Do Span calibration.
- Input the number following new place Gravitational Acceleration.

Operation

Press MODE → CALIBRATION → PAGE → GRAV.ACCELERATION → Input GRAV. Acceleration 01~16 → OK

Gravitational accceleration

01	9.806	02	9.805	03	9.804	04	9.803
05	9.802	06	9.801	07	9.800	08	9.799
09	9.798	10	9.797	11	9.796	12	9.795
13	9.794	14	9.793	15	9.792	16	9.791

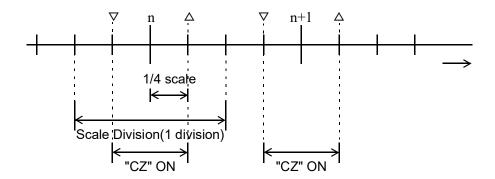
5-4-9. 1/4 scale division

It divides the Minimum scale division into four (4) parts. The "CZ" (Center Zero) Lamp turns on when the weight is between +1/4 and -1/4 division.

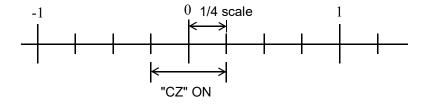
Operation

Press MODE
$$\rightarrow$$
 CALIBRATION \rightarrow PAGE \rightarrow 1/4 SCALE DIV DISPLAY \rightarrow Select ON/OFF \rightarrow OK

When 1/4 Scale Division Display selects ON.



When the 1/4 Scale Division Display selects OFF, "CZ" lamp only works at the Zero Point.



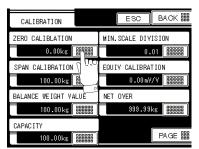
5-5. Zero Calibration

Register the initial zero point.

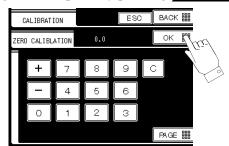
Verify there are no excess loads applied to load cell or scale.

Check [STAB] in green appears on the comparison screen.

- 1) Press the MODE Bell button.
- 2) Select the "CALIBRATION" tag.
- 3) Press "ZERO CALIBRATION" tag.



4) Register zero point by pressing OK



5) Zero calibration is completed when the CALZ changes to RUN and numeral display become to "0" on the comparison screen.

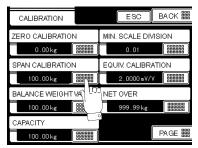
If a calibration error is displayed, redo zero calibration following the description on the message screen.

- CAL. ERR. 2: The initial dead load is above zero adjustment range.
- CAL. ERR. 3: The initial dead load is negative.

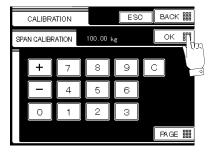
5-6. Span Calibration

Apply the load (Balance weight) to the load cell or scale.

- The balance weight should be full capacity to get the best linearity. The balance weight must be at least 50% of scale capacity.
- Verify there is no excess load (except Balance weight) applied to the load cell or scale.
- Check STAB in green appears on the comparison screen. Correct calibration cannot be completed if the signal is unstable.
- 1) Press the MODE button.
- 2) Select the "CALIBRATION" tag.
- 3) Press "SPAN CALIBRATION" tag.



4) When used balance weight is equal to the capacity press OK ; if not input the real weight then press OK .



5) Span calibration is completed while the CALS changes to RUN and display the real weight on the comparison screen.

If a calibration error is displayed, redo span calibration following the description on the message screen.

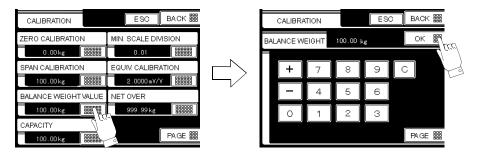
- CAL. ERR. 4: The entered balance weight value is beyond the Capacity.
- CAL. ERR. 5: The enter balance weight value is 00000 Re-enter the correct value.
- CAL. ERR. 6: The load cell output does not reach the span adjustment range.
- CAL. ERR. 7 : The load cell output is negative.
- CAL. ERR. 8: The load cell output is beyond the span adjustment range.

Regarding to error massage, refer to trouble shooting on the page 162.

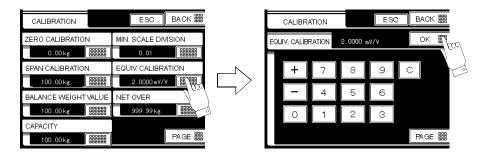
5-7. Do Secondary Calibration (Equivalent Calibration)

Input the mV/V of load cell corresponds to the input Balance weight to instrument, instrument will calibrate it following the inputted values.

- 1) Press the MODE iii button.
- 2) Select the "CALIBRATION" tag.
- 3) Press "BALANCE WEIGHT" tag, key input the weight value then press OK



4) Press "EQUIV. CALIBRATION" tag, key input the corresponded mV/V to the inputted weight value then press OK 盟.



5) Equivalent Calibration is completed while the CALS changes to RUN and display the real weight on the comparison screen.

If the calibration error CAL.ERR.1 is displayed, redo Zero calibration.

6. FUNCTION SETTING

6-1. Display Frequency

Select the F805AT-MD Display Frequency. The numbers of updates on the display per second is 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 per second. 25 times per second is recommended for normal operation.

If the display flickers, select a lower frequency.

Operation

Press

MODE → OPERATION → DISPLAY FREQUENCY → Select from 3,6,13 or 25 Times/ Sec → OK

6-2. Digital Filter

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 2 to 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.

Operation

Press

MODE SETTING → OPERATION → DIGITAL FILTER1 → Select from 2,4,8,16,32,64 or 128 Times → OK

6-3. Analog Filter

This function stabilizes the display by removing low frequency noise from the load cell signal as well as averaging analog signals.

Selectable frequencies are: 2, 4, 6 and 8 Hz. A higher frequency will make a more quick response but sometimes read a noise in.

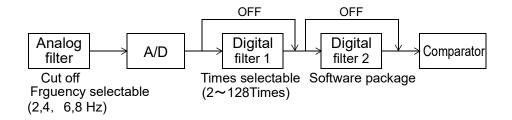
Select the most suitable value for the weighing.

Operation

Press MODE → OPERATION → ANALOG FILTER
→ Select from 2,4,6 or 8 Hz → OK

6-4. Digital Filter2

Digital filter2, is a software package use to quickly eliminate the effects of plant vibration on weighing systems, while yielding a stable weight reading.



Operation

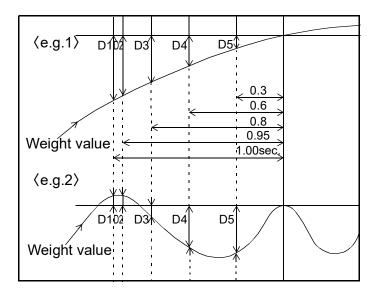
Press MODE SETTING → OPERATION → DIGITAL FILTER2

→ Select ON/OFF → OK

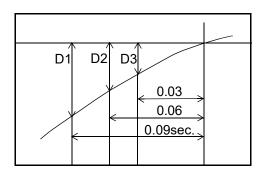
6-5. Motion Detection

When signal fluctuation is less than the result (range × Min.Scale Div.) and is within the set period, weighing value is stable and **STAB.** display lights. The two modes of Motion Detection in the F805AT-MD are: Stable Mode and Check Mode.

<u>Stable Mode</u>: Per each A/D conversion, the current weight is compared to one (1) second previous. If the any of the set parameters are exceeded, **STAB.** display goes out. (Refer to the following chart)



<u>Check Mode</u>: Per each A/D conversion, the current weight is compared to 0.09 second previous. If the any of the set parameters are exceeded, **STAB.** display goes out. (Refer to the following chart)



While STAB.display is on, an additional filter may be inserted to help stabilize the signal. (Refer to digital filter 2 on page 44.)

Setting of Motion Detect Parameter

1) MD MODE Select the condition from Stable mode or Checker mode in

Motion Detection Mode.

2) MD PERIOD Setting the period for judging the stability of weight

(input range: $0.0 \sim 9.9$).

3) MD RANGE Comparing the value (setting value×minimum scale

division) with the range of weight change.

Operation

Press 1) MODE → OPERATION → MOTION DITECTION MODE → Select STABLE / CHECKER → OK

Press 2) MODE → OPERATION → MD(PERIOD) →Input 0.0~9.9 → OK

Press 3) MODE → OPERATION → MD(RANGE) →Input 0~99 → OK

6-6. Zero Tracking

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

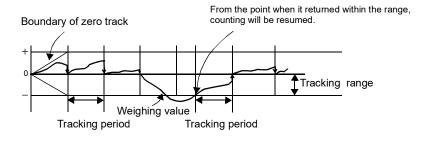


- Zero tracking is the function to reset gross weight to zero automatically when the state remaining the zero point drift within the zero tracking range continues more than set period.
- •Zero tracking period must be set between $0.1 \sim 9.9$ second and its range must be set between $1 \sim 99$ using 1/4 resolution interval of weight display.

 For instance, 02 corresponds to 0.5 and 12 corresponds to 3 of weight display.

 Zero tracking range is not proportional to the Minimum scale division regardless of the setting state of Minimum scale division.

 Zero tracking does not work if you set the period to 0.0 sec. and range to 00.



Operation

ZT PERIOD:

Press MODE → OPERATION → PAGE → ZERO TRACKING(PERIOD) → Input 0.1~9.9 → OK

ZT RANGE:

Press MODE → OPERATION → PAGE → ZERO TRACKING(RANGE) → Input 1~99 → OK

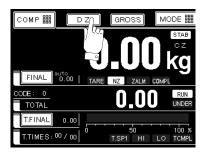
6-7. Digital Zero

The Digital Zero function zeroes the Gross Weight to adjust for slight shifts at the zero point due to load cell drift or dregs remaining on a scale.

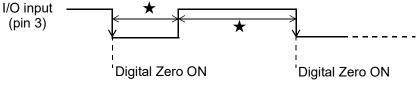
If Digital Zero is operated when the displayed weight is beyond the set Digital Zero Regulation Value (refer to P.49), then the Zero Alarm is actived, ZALM appears red.

Operation

Display GROSS on the to main display then press DZ



To operate Digital Zero via the Control connector on the rear panel, input ON edge signal to the pin 3 (D/Z ON) and the COM (Common).



★ Pulse width: more than 50ms

6-8. Digital Zero Clear

When ZALM highlights in red, do Digital Zero Clear.

Then Digital Zero will be cleared and ZALM goes out.

Operation

Input PASSWORD 1269 \rightarrow 1111 in order.

6-9. Digital Zero Regulation Value

Set a range for Digital Zero adjustment (a gap from the Registered Zero Calibration) by operating Digital Zero or Zero Tracking.

Operation

Press MODE → OPERATION → PAGE → DZ REGULATION VALUE → Input 0~9999 → OK

6-10. Tare Subtraction/ Reset

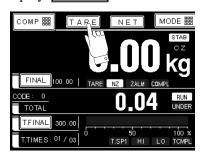
Tare is subtracted and the Net weight is zeroed by pressing $\boxed{\text{TARE}}$ tag on the top. The Gross weight will not be changed by this function. The range of Tare Subtraction may be selected between the "whole range" and $0 < \text{Tare} \le \text{Capacity}$.

Also, the Tare subtraction operation could be done during weight is stable, or in regular. The subtracted Tare can be restored and Net weight becomes equal to the Gross weight.

Operation

Press MODE → EXTENDED FUNC. → RANGE OF TARE SUB. → Select WHOLE RANGE ✓ 0 < TARE ≦ CAPA. → OK

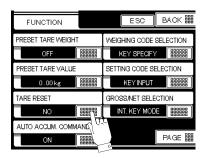
Display NET on the main display then press TARE

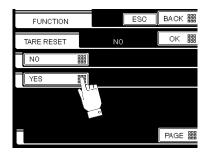


Press MODE → EXTENDED FUNC. → ONE TOUCH TARE SUB. → Select REGULARY / IN STABLE MODE → OK

Press MODE → FUNCTION

1) Press TARE RESET **IIIII** in FUNCTION MODE





To operate Tare Subtraction, Tare Reset could also be done via the Control I/O on the rear panel by shorten input pin 4, pin 5 to COM.

6-11. Digital Preset Tare Weight

In addition to Tare Subtraction, there is Preset Tare Weight function. To subtract the set value in Preset Tare Value from Net weight, the Preset Tare Weight must be set to ON. Then doing Tare Reset could not restore the value of Preset Tare Value into Net weight. If you active Tare subtraction, while the Preset Tare weight, to reset or change the Preset Tare Value and the status of Preset Tare Weight will be decided by the setting in Extended Preset Tare Sub., Valid/ Invalid (Effect/ Inhibit). When Extended Preset Tare Sub. selected Valid (Effect) could not reset value and status.

Operation

```
Press MODE → FUNCTION → PRESET TARE VALUE → Set Tare 0~99999 → OK → PRESET TARE WEIGHT → ON → OK
```

To view the stored Tare subtraction value by holding TARE tag on the screen, while make sure TARE KEY ON is selected in the following procedure. When Preset Tare Weight is acted, the displayed Tare weight equals Tare subtracted weight + Preset Tare Value.

```
Press MODE → EXTENDED FUNC. → TARE DISPLAY → Select INHIBIT / TARE KEY ON → OK
```

6-12. GROSS/ NET Display

The display value is switched between Gross and Net weight by pressing GROSS NET tag on the top of each display Screen, or through control input / output connector on the rear panel.

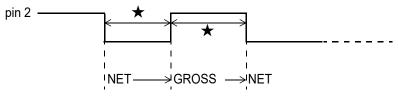
Via the Function setting item, to choice the way of switching is done by touch screen or input signal through I/O. When the later way is selected, the touch screen will be locked.

Operation

MODE → FUNCTION → GROSS/NET SELECTION → Select INT. KEY MODE \angle EXT. INPUT MODE → OK

In "Internal Key Mode", also do toggle motion via control I/O could switch between them.

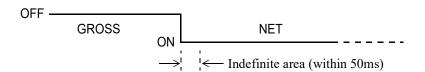
NET: ON edge (OFF \rightarrow ON) GROSS : OFF edge (ON \rightarrow OFF)



★ Pulse width: more than 50ms

In "External input Mode".

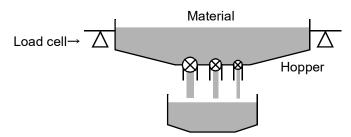
NET: ON level GROSS : OFF level



6-13. Reversing Symbol at Discharge Control

When discharging a fixed quantity material from material bin, Net weight becomes negative.

Discharging weight can be revised to positive by reversing the polarity of the Net weight. Select from Net weight with - SIGN ON or Net weight with - SIGN OFF.



Operation

MODE \rightarrow FUNCTION \rightarrow PAGE \rightarrow DISCHARGING CONTROL SIGN \rightarrow Select - SIGN ON/OFF \rightarrow OK

6-14. TARE/ DZ Key Disablement

It can be inhibited the operation of TARE DZ for avoiding false operation on Comparison and Massage screen. Select VALID or INVALID in the Function setting item.

Operation

MODE → FUNCTION → PAGE → TARE / DZ KEY → Select INVALID / VALID → OK

6-15. GROSS/ NET Key Disablement

It can be inhibited the operation of GROSS NET for avoiding false operation on the each display Screen.

Select VALID or INVALID.

Operation

MODE → FUNCTION → PAGE → GROSS/NET KEY → Select INVALID / VALID → OK

6-16. I/O Monitor Display

The view as popup which can monitor the operation state of an external I/O signal by pushing a specific domain is performed. Select Effect or inhibit.

- INHIBIT..... A view as popup is not performed.
- EFFECT If a specific domain is pushed in a comparison screen, a pop-up screen will be displayed.

In order to close a pop-up screen, please push the inside of a pop-up screen.

A push on a specific domain will display a pop-up screen.



The inside of a pop-up display becomes the display interlocked with the operation state of the output pin (17-24 and 42-49 pin) / input pin (2-9, 11-14, 27-34, and 36-39 pin) of control I/O.

It is displayed by "●" at the time of ON, and is displayed by "-" at the time of OFF.

A screen will be closed if a specific domain is pushed into a pop-up display.





* In the state where the pop-up screen is displayed, if this setup is repealed with a communication command etc., a pop-up screen will be closed.

Operation

MODE → EXTENDED FUNCTION → I/O MONITOR DISPLAY → Select INHIBIT/ EFFECT \rightarrow OK

7. CODE SETTING AND OPERATION

There are 100 weighing parameters could be preset into F805AT-MD. Relative to each Code number, they are Final weight, SP1, SP2, FF CPS., Over, Under, FF CPS. regu and Auto jog timer. To operate preset parameters is randomly by trigging code # designation via Control Input / Output on the rear panel.

<Setting Example>

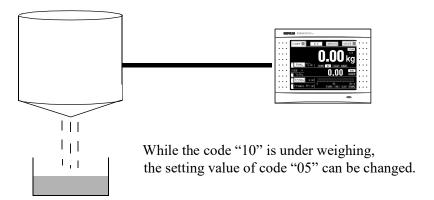
CODE	FINAL	SP2	SP1	FF CPS.	OVER	UNDER	FF CPS.	AUTO	TOTAL	TOTAL	SP0
No.							REGU	JOG TIM	FINAL	SP1	
00	100.00	20.00	10.00	1.00	0.50	0.50	1.50	1.00	500.00	200.00	5.00
01	50.00	10.00	5.00	0.50	0.50	0.50	0.75	0.75	200.00	100.00	2.00
			•		•		•				
		•	•		•	•	•	•	•	•	
	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•	•	•	•	•	•	•	
	•	•	•	•	•	•	•	•	•	•	
	•	•	•		•	•	•	•	•	•	•
99	200.00	50.00	10.00	5.00	1.00	1.00	6.00	2.00	1000.00	400.00	5.00

In order to satisfy the automation control requirements, during specified code is under weighing F805AT-MD other codes setting value could be changed or reset. Also, to select weighing code or setting code number could be done by key specify, via control I/O or combinations.

Operation

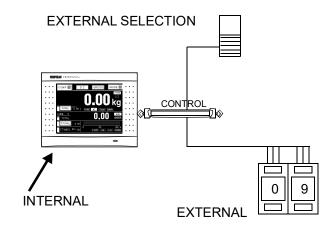
MODE → FUNCTION → WEIGHIN CODE SELECTION → Select from KEY SPECIFY / EXTERNAL INPUT / SELECTION \rightarrow OK

MODE → FUNCTION → SETTING CODE SELECTION → Select from KEY INPUT / EXTERNAL INPUT / SELECTION \rightarrow OK



While weighing with the Setting Value of Code "10", the Setting Value of Code "05" can be changed

When "Selection" is chosen here, whether it is by Key or via Control I/O to do this operation will be decided by the On/Off of pin 33 of control I/O on the rear panel.



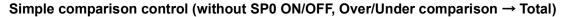
On Comparison screen and Data display screen always correspond to the parameter of weighing code.

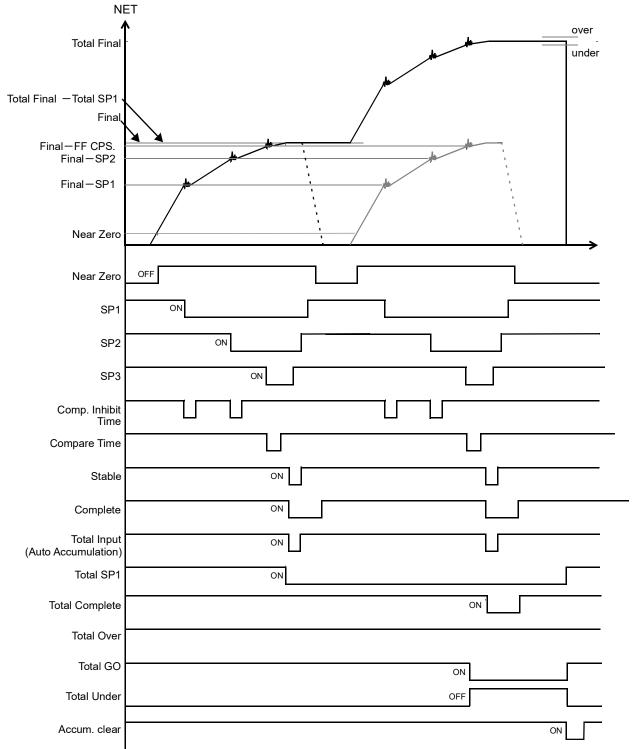


Do not change Weighing Code Number during Weighing process or do not switch to the unused code regularly otherwise it may sometimes not work normally. Weighing is performed by using Final discharge setting value of weighing code presently selected.

7-1. Final / SP2 / SP1 / FF CPS. / Over / Under

It is a setup for controlling final discharge or judging.





With the value set up here, a control signal is outputted outside from a control connector.

Conditional formulas:

When weighing value \leq set value of Near Zero, the Near Zero output signal turns on.

When weighing value \geq Final – Set Point 1, the SP1 output signal turns on.

When weighing value \geq Final — Set Point 2, the SP2 output signal turns on.

When weighing value \geq Final - FF CPS., the SP3 output signal turns on.

When weighing value \leq Final — Under, the Under output signal turns on.

When weighing value > Final + Over, the Over output signal turns on.

When Final + Over \ge weighing value \ge Final - Under, the Go output signal turns on.

Final / SP2 / SP1 (input range / 0-99999)

FF CPS. (input range / 0-9999)

Over / Under (input range / 0-999)

*When SP1 and SP2 are not used, set the SP1 and SP2 value equal to Final.

Operation

MODE → EACH CODE → Select Code No.

or

OK → (EACH SETTING ITEM)

7-2. FF CPS. Regu/ FF CPS./ AVG. Count of FF CPS./ FF CPS. Coefficient

Free Fall Compensation adjusts the amount of suspended ingredient automatically to reduce weight error. Register Free fall compensation parameter.

Principle of free fall compensation

Sampling the weighing value when the complete signal turns ON after SP3 finished. Record "n" times(A) (Average Count of FF CPS.) the difference(D) between set Final value and actual weight value, average the difference and multiplied by FF CPS. coefficient, then add the result to FF CPS. value.

Value added to FF CPS. value
$$\frac{(D_1 + D_2 + D_3 \cdot \cdot \cdot \cdot \cdot D_A)}{A} \times C$$

F805AT-MD can regulate the value of D for minimizing the errors.

When D is within the range of (Final + FF CPS. Regulation) \geq Actual weight \geq (Final - FF CPS. Regulation), it will be treated as a effective value.

And this function will work when Free Fall compensation is selected ON.

* All Free Fall Compensation is available for each Code number respectively.

The Weighing value operated by weighing control with the set value of SP0 while Effect is selected in SP0 Mode is not a subject for compensation thus sample counting will not be done.

Example)	Final	20.000
	Free fall compensation regulation	0.100
	Average count of FF CPS.	4
	FF CPS. coefficient	2 / 4

Times	Actual weighing	Error	Average count of FF CPS	.FF CPS.
0			0	\leftarrow Power ON
1	20.050	+0.050	1	0.500
2	20.040	+0.040	2	0.500
3	20.070	+0.070	3	0.500
4	20.080	+0.080	$4 \rightarrow 0$	0.500
		+0.240/4	$\bar{k} = 0.060$	
			$0.060 \times 2/4 = 0.030$	\rightarrow FF CPS. Value
5	20.020	+0.020	1	0.530
6	20.000	0.000	2	0.530
7	20.010	+0.010	3	0.530
8	20.110	(+0.110)	←×3	0.530
9	20.010	+0.010	$4 \rightarrow 0$	0.530
		+0.040/4	$\bar{k} = 0.010$	
			$0.010 \times 2/4 = 0.005$	\rightarrow FF CPS. Value
10	19.880	(-0.120)	←×1	0.535
11	19.990	-0.010	1	0.535
12	20.010	+0.010	2	0.535
13	20.000	0.000	3	0.535
14	19.980	-0.020	$4 \rightarrow 0$	0.535
		-0.020/4	$\overline{4} = -0.005$	
			$-0.005 \times 2/4 = -0.003$	\rightarrow FF CPS. Value
				0.532

Setting FF CPS. coefficient

FF CPS. coefficient can be selected from 1/4, 2/4, 3/4, or 1.

You can get more accurate FF CPS. value by selecting 1 when each time weighing value is approximate to same the value or selecting $1/4 \sim 2/4$ when there are fluctuates in each measuring.

1) FF CPS. Regulation Set the Regulated value to each Code for avoiding FF CPS.

Regulation value becomes extremely large (or small).

(input range $/ 0 \sim 99999$)

2) FF CPS. ON/OFF Select ON or OFF, valid or invalid Free Fall function.

3) Average Count of FF CPS. Recording to the set average times to update FF CPS. value.

(input range $/1 \sim 9$)

4) FF CPS. coefficient Setting coefficient, the multiply percentage to updated

value.

Operation

- 1) MODE \rightarrow EACH CODE \rightarrow Select Code No. + or \rightarrow OK \rightarrow FF CPS. REGU \rightarrow Input 0~99999 \rightarrow OK
- 2) MODE → COMPARISON → PAGE → PAGE → FF CPS. → Select ON/OFF → OK
- 3) MODE → COMPARISON → PAGE → PAGE → AVERAGE COUNT OF FF CPS. → Input 1~9 → OK
- 4) MODE → COMPARISON → PAGE → FF CPS. COEFFICIENT → Select from 1, 3/4, 2/4 or 1/4 → OK

7-3. Each Code Key Disablement

F805AT-MD enables to disable Each Code key (Final, SP2, SP1, FF CPS., Over, Under, FF CPS. regu, Auto jog timer, Accum.clear, Total final, Total SP1, SP0) for avoiding false operation on the touch screen.

Select between Valid and Invalid.

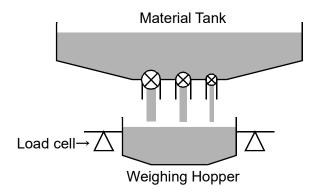
Operation

MODE → FUNCTION → PAGE → EACH CODE KEY → Select INVALID / VALID → OK

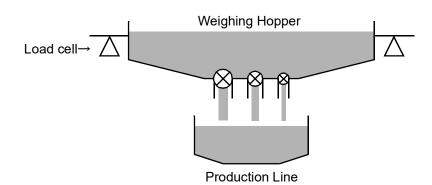
8. WEIGHING MODE SETTING AND OPERATION

8-1. Feed Weighing And Discharge Weighing

Two types of weigh and control of material quantity, i.e. "feed weighing" and "discharge weighing" are used by F805AT-MD.



Discharge weighing....to weigh and control quantity of material being discharged from weighing hopper to production line..

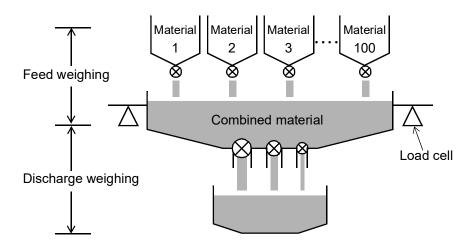


8-2. Combined Use of Feed / Discharge Weighing

Feed weighing and Discharge weighing can be switched over each other during weighing process. Such switching can be made either through touch screen or by a signal from control connector on rear panel of the unit.

Taking advantage of the switching over function between them, F805AT-MD controls feeding predetermined quantity of different ingredient from bin and formulate a batch of material blend in weighing hopper F805AT-MD can store even 100 sets of ingredient formula. Thus, versatility of F805AT-MD is widely enhanced. (See sketch below)

Multi-ingredient batching



8-3. Weighing Mode

Set the Feeding or Discharging. Select from Feeding, Discharging or External (switching the Feeding/ Discharging by the signal from External In/Out connector) in Discharge control mode.

Operation

MODE → COMPARISON → PAGE → WEIGHING MODE → Select from FEEDING, DISCHARGING or EXTERNAL → OK

Feeding/Discharging can be switched by 7Pin when External is selected. OFF (HI): Feeding control, ON(LO): Discharging control

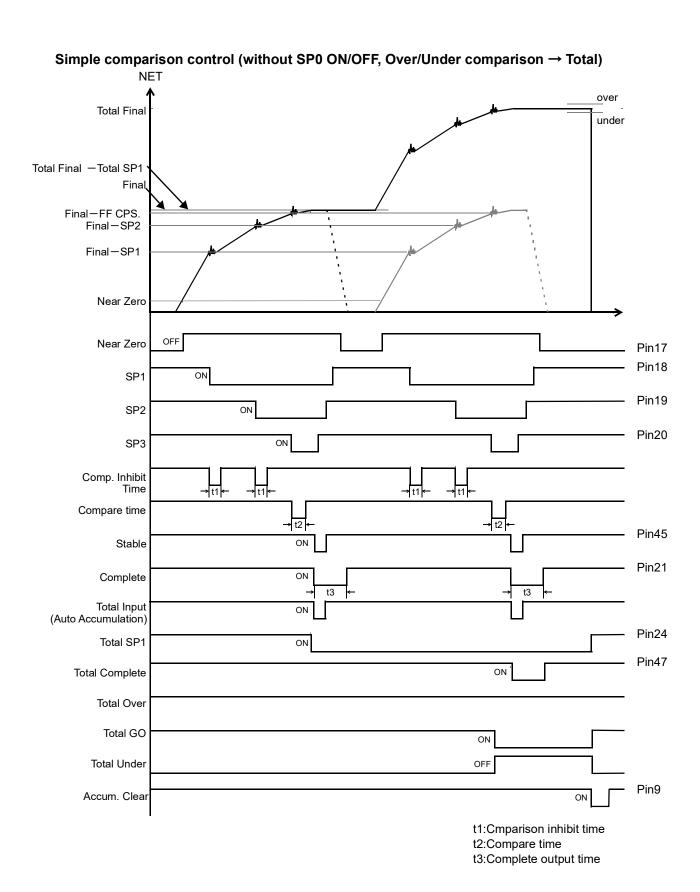
8-4. Weighing Comparison

Set weight value compared with setting value of Final to perform Weighing comparison.

Operation

MODE → COMPARISON → PAGE → WEIGHING COMP. → Select GROSS / NET → OK

8-5. Simple Comparison Control and Sequence Control



- ♦ The time chart on the previous page used a "Compare regularly" which is decided by selecting in "Over/Under Comparison mode" of the Comparison mode.
- ♦ The period of the output "Complete" signal is decided by selecting in "Complete signal output" of the Comparison mode.
- ♦ In Simple comparison mode, the status is judged ready for the next weighing when the weight value lowers 25% of Final after previous weighing completed.
- ♦ The duration of the signals t1, t2 and t3 are inputted in the same Comparison mode.
 - t1 : Comparison Inhibit Time, during this period do not comparing with the set values, it eliminates false in tuning hoper gates (or valves)
 - t2: Compare Time, it works for the same purpose but during free fall period
 - t3 : Complete Output Time, the complete signal output duration

♦ Conditional formulas :

When weighing value \leq set value of Near Zero, the Near Zero output signal turns on.

When weighing value \geq Final — Set Point 1, the SP1 output signal turns on.

When weighing value \geq Final — Set Point 2, the SP2 output signal turns on.

When weighing value \geq Final - FF CPS. the SP3 output signal turns on.

When weighing value < Final - Under, the Under output signal turns on.

When weighing value > Final + Over, the Over output signal turns on.

When Final + Over \ge weighing value \ge Final - Under, the Go output signal turns on.

When Total weighing value \geq Total final – Total SP1, the T. SP1 output signal turns on.

When Total weighing value < Total final – Under, the Under output signal turns on.

(When Total is selected in Over/Under comparison.)

When Total weighing value > Total final + Over, the Over output signal turns on.

(When Gross/Net is selected in Over/Under comparison.)

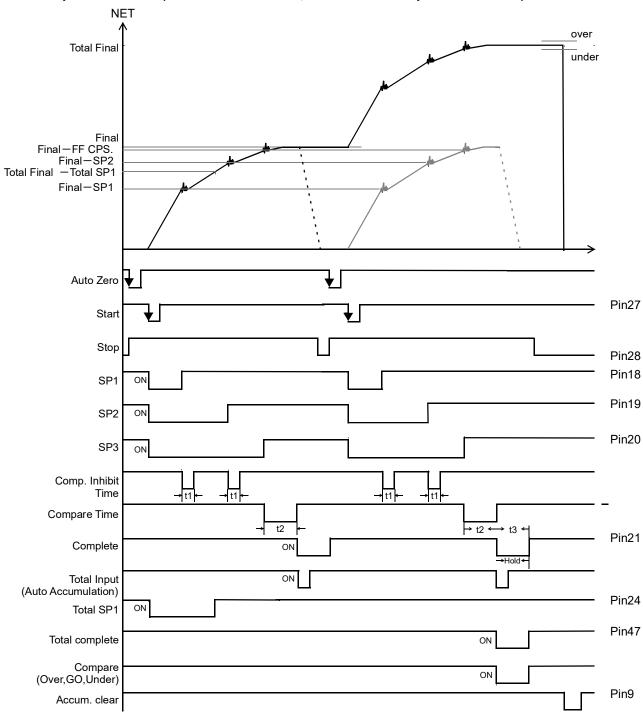
When Total final + Over \geq Total weighing value \geq Total final – Under,

the Go output signal turns on.

(When Total is selected in Over/Under comparison.)

- ♦ The compared weighing value at Near Zero can be selected Gross, Net, Absolute Gross, Absolute Net or Comparison OFF in "Near Zero Comparison";
- ♦ The compared weighing value with Final, Over/Under can be selected Gross, Net or Comparison OFF in "Over/Under Comparison" of the Comparison mode.

Sequence control (without SP0 ON/OFF, Over/Under comparison → Total)



t1:Cmparison inhibit time

t3:Complete output time

t2:Compare time

- ♦ Sequence mode ignores the selections in "Upper/Lower Comparison mode" and "Over/Under Comparison mode" of the Comparison mode. Over/Under compares when the "Complete" output signal gets ON and weight value is held. Upper/Lower limit compares regularly.
- ♦ The period of the output 'Complete' signal is decided by selecting in "Complete signal output" of the Comparison mode.
- ♦ The duration of the signals t1, t2 and t3 are inputted in the same Comparison mode.
 - t1: Comparison Inhibit Time, during this period do not comparing with the set values, it eliminates false in tuning hoper gates (or valves)
 - t2: Compare Time, it works for the same purpose but during free fall period
 - t3: Complete Output Time, the complete signal output duration

♦ Conditional formulas :

When weighing value \leq set value of Near Zero, the Near Zero output signal turns on.

* Weighing sequence start at the ON edge of the start signal (OFF \rightarrow ON), SP1, SP2 and SP3 turn ON.

When weighing value \geq Final – Set Point 1, the SP1 output signal turns off.

When weighing value \geq Final – Set Point 2, the SP2 output signal turns off.

When weighing value \geq Final - FF CPS., the SP3 output signal turns off.

When weighing value < Final — Under, the Under output signal turns on.

When weighing value > Final + Over, the Over output signal turns on.

When Final + Over \ge weighing value \ge Final - Under, the Go output signal turns on.

When weighing value \leq set value of Total SP1, the T. SP1output signal turns off.

When total weighing value < Total final – Under, the Under output signal turns on.

When total weighing value > Total final + Over, the Over output signal turns on.

When Total final + Over \geq Total weighing value \geq Total final – Under, the Go output signal turns on.

- ♦ The compared weighing value at Near Zero can be selected Gross, Net, Absolute Gross, Absolute Net or Comparison OFF in "Near Zero Comparison";
- ♦ The compared weighing value with Final, Over/Under can be selected Gross, Net or Comparison OFF in "Over/Under Comparison" of the Comparison mode.

8-6. Simple Comparison Mode/Sequence Mode

Operation

MODE → SEQUENCE MODE → SEQUENCE MODE → Select SIMP. COMP MODE / SEQUENCE MODE → OK

8-7. The Disablement of The START & STOP Key

To start or stop weighing sequence, except inputting signal via Control I/O, also could push **START** and **STOP** tab on the Message screen. In order to avoiding the miss touching during systems operation, they could be disabled by going through setting menu, change them to invalid.

Operation

Press MODE → SEQUNCE MODE → PAGE → START / STOP KEY → Select INVALID / VALID → OK

8-8. Near Zero/Upper Limit/Lower Limit

- ♦ Conditional formulas:
 - 1) When weighing value ≤ set value of Near Zero, the Near Zero output signal turns on
 - 2) When total value > set value of Upper Limit × 10, the Upper Limit signal output turns on.
 - 3) When total value < set value of Lower Limit × 10, the Lower Limit signal output turns on.

Operation

- 1) MODE → COMPARISON → NEAR ZERO → Input 0-99999 → OK
- 2) MODE → COMPARISON → UPPER LIMIT → Input 0-99999 → OK
- 3) MODE → COMPARISON → LOWER LIMIT → Input 0-99999 → OK

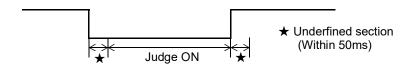
8-9. U/L Limit Comparison / U/L Limit Comparison Mode/ Near Zero Comparison / Over/Under Comparison / Over/Under Comparison Mode

Weight (Gross/Net) to be compared or Timing of comparison can be selected at each compared point of Upper/Lower Limit, Near zero, Over/Under.

Operation

- 1) MODE → COMPARISON → U/L LIMIT COMPARISON → Select from GROSS, NET, TOTAL or COMPARISON OFF → OK
- 2) MODE → COMPARISON → U/L LIMIT COMP. MODE → Select COMP. REGULARLY / EXT. JUDGING ON → OK
- MODE → COMPARISON → NEAR ZERO COMPARISON → Select from GROSS, NET, COMPARISON OFF, ABSOLUTE GROSS or ABSOLUTE NET → OK
- 4) MODE → COMPARISON → OVER/UNDER COMPARISON → Select from GROSS/NET, TOTAL or COMPARISON OFF → OK
- 5) MODE → COMPARISON → PAGE → OVER/UNDER COMP. MODE → Select from COMP.REGULARLY EXT.JUDGING ON, COMP.SIGNAL.ON or COMP.ON HOLD→ OK

The External judging signal is 6 pin of external input/output connector.



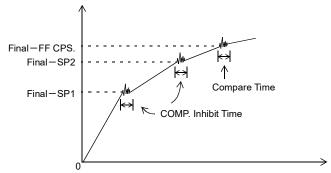
6 pin (Hold or Judge) automatically becomes Judge input pin when "EXT. JUDGING ON" is selected in U/L LIMIT COMP. MODE or OVER/UNDER COMP. MODE.

Select COMP. REGULALY in OVER/UNDER COMP. MODE in Sequence mode since External judging input is not available in the mode.

8-10. Complete Signal Output/ Complete Output Time/ Compare Time/ Comp. Inhibit Time

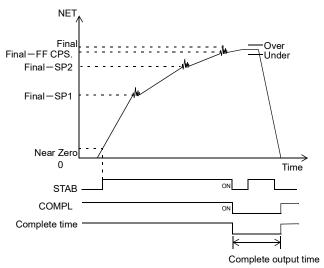
- Comparison inhibit time/Compare time

The function which inhibits the comparison for certain period of time to eliminate false control or judgement by vibration caused by opening or closing valves.



Complete output time

Setting the period of complete signal output (Control connector pin21, 47pin) when the weighing is completed.



Complete signal output

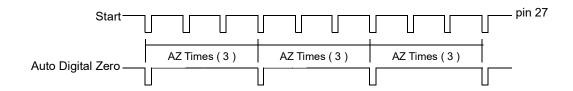
Setting the condition for judging the completion of Gross/Net final discharge.

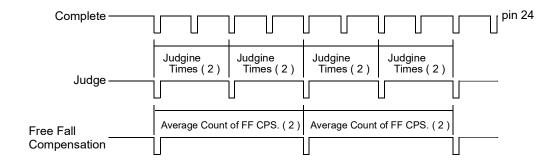
Operation

- 1) MODE → COMPARISON → PAGE → COMPLETE SIGNAL OUTPUT → Select from COMPARE TIME, COMP.&STABLE or COMP. / STABLE → OK
- 2) MODE → COMPARISON → PAGE → COMPLETE OUTPUT TIME →Input 0.0-9.9 → OK
- 3) MODE → COMPARISON → PAGE → COMPARE TIME →Input 0.0-9.9 → OK
- 4) MODE → COMPARISON → PAGE → COMP. INHIBIT TIME →Input 0.00-9.99 → OK

8-11. Judging Times/ AZ Times/ At Start NZ Confirmation/ At Start WV Confirmation/ Auto Jog/ Auto Jog Timer/ Discharge Gate Control/ Discharging Time

(*Underlined items above are only set for final discharging of Gross/Net)





If the set value in "Judging times" of the Sequence mode is 1, do a final, Over/Under Comparison after each weighing during the output of complete signal.

When the "Judging times" are set 2 ... 99 times, do a Comparison for that number after getting complete signal.

If the "Judging times" is set to 0, Final Over/Under Comparison is inactive, refer to Sequence without judgment section please.

If the set value in "AZ times" of the Sequence mode is 1, in Gross weighing do an Auto digital Zero before each weighing start; in Net weighing do a Tare subtraction.

If the "AZ times" are set 2 ... 99 times, do an Auto digital Zero for that number of starts.

If the "AZ times" are set to 0, the Auto digital Zero is inactive until key operation or external input D/Z or Tare ON signal.

Setting in Sequence Control

Set the various parameters for serial operation from weighing start to completion. Sequence controls are classified into following categories.

- Normal Sequence Control
 Start weighing with start signal and finish the weighing by the output of complete signal.
- Sequence Control with Auto Jog
 Auto Jog is executed for the set period in Auto Jog Timer after completing the weighing.
- 3) Sequence control with Discharge gate control
 Discharge material by opening discharge gate for the set period in discharging time
 after completing the weighing. Then proceed to next weighing.

a) Judging Times

The Selection whether conduct the judgment on Over, Under or Go when complete signal is outputted after completing the weighing.

Set the number from 00 to 99.

- 00: Without Judging
- 01 : Conducting Judging every time
- 02 : Conducting one judging for every twice
- 03 : Conducting one judging for every three times
- 99 : Conducting one judging in 99 times



5

Notice

FF CPS. and Auto Accum. function enable to memorizes the compensation samples by using Over/ Under Judging signal. If judging times is set 00 (without judging), F805AT-MD can not memorize the samples for FF CPS. and Auto Accum.

Conseguently, FF CPS. and Auto Accum. function will not work.

When you use FF CPS. and Auto Accum. function, Judging times should be set more than 01.

b) AZ Times

The selection whether the weighing value is set 0 or not at start.

When Weighing value = Gross weight, conduct Digital 0 or when Weighing value = Net weight, subtract the Tare to set Weighing value for 0.

Set the number from 00 to 99.

- 00: Without Auto 0
- 01 : Conduct one Auto Zero every time.
- 02 : Conduct one Auto Zero for every twice.
- 03 : Conduct one Auto Zero for every three times.

5

99 : Conducting one Auto Zero in 99 times

c) At Start Near Zero Confirmation



- Auto Zero is operated at the same time when Start signal is ON.
- Sequence Error 3 will be displayed when Zero Alarm is caused by Auto Zero.
- Tare Subtraction and Digital Zero can be operated via the front keys or the control connector even if AZ times is set 00 (without Auto Zero).

Setting for confirming whether Near Zero signal ON at the start of weighing. (Select ON or OFF).

Weighing will normally start if Near Zero is ON. Sequence Error 4 is displayed if Near Zero is OFF.

Refer to "Near zero [pin 17]" on page 117 concerning Near Zero setting

d) At Start Weight Value Confirmation

Setting for confirming whether the weighing value has reached SP1 point (Final Setting Value - SP1 Setting value) at the start of weighing.

Or confirms whether Total value exceeds Total SP1.

(Select ON or OFF) If has, Sequence Error 5 will be displayed.

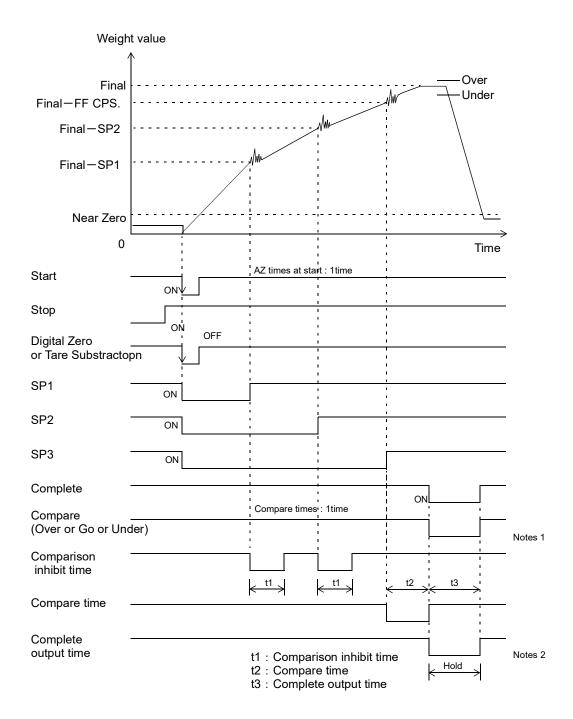
Refer to "Final / SP2 / SP1 / FF CPS. / Over / Under" on page 57 concerning SP1 setting.

- e) Auto Jog
- f) Auto Jog Timer

Operation

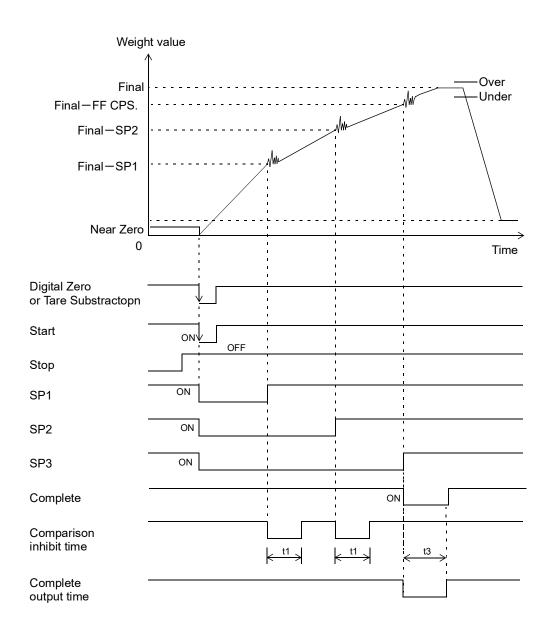
- a) MODE → SEQUENCE MODE → JUDGING TIMES→ Input 0 ~ 99→OK
- b) MODE → SEQUENCE MODE → AZ TIMES→ Input 0 ~ 99→OK
- c) MODE → SEQUENCE MODE → AT START NZ CONFIRMATION → Select OFF/ ON → OK
- d) MODE \rightarrow SEQUENCE MODE \rightarrow AT START WV CONFIRMATION \rightarrow Select OFF/ ON \rightarrow OK
- e) MODE → SEQUENCE MODE → AUTO JOG→Select OFF/ ON → OK
- f) MODE → EACH CODE → Select Code No. + or → OK → AUTO JOG TIM →Input 0 ~ 999→ OK

8-11-1. Normal sequence control (Weighing mode of Gross / Net weight)



- ♦ The period of the output "Complete" signal is decided by selecting in "Complete signal output" of the Comparison mode.
- ♦ Sequence mode ignores the selections in "Upper/Lower Comparison Mode" and "Over/ Under Comparison Mode" of the Comparison mode. Over/Under compares when the "Complete" output signal gets ON and weight value is held. Upper/Lower limit compares regularly.

8-11-2. Sequence without judgment (Weighing mode of Gross / Net weight)

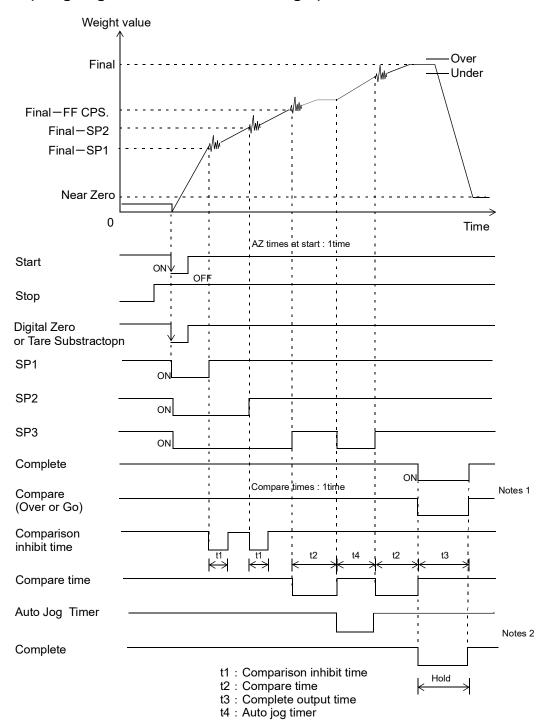


t1 : Comparison inhibit timet3 : Complete output time

♦ The set value in "Judging times" of the Sequence mode is 0, final Over/Under Comparison is inactive. At the same time it ignores the selection in "Complete signal output" of the Comparison mode.

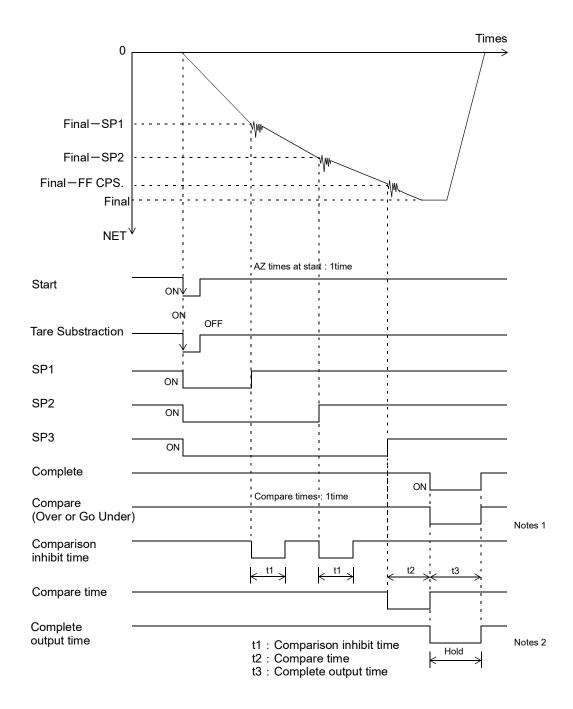
When the SP3 output signal at the OFF edge (ON \rightarrow OFF) Complete signal turns ON.

8-11-3. Sequence with auto jog effective (Weighing mode of Gross / Net weight)



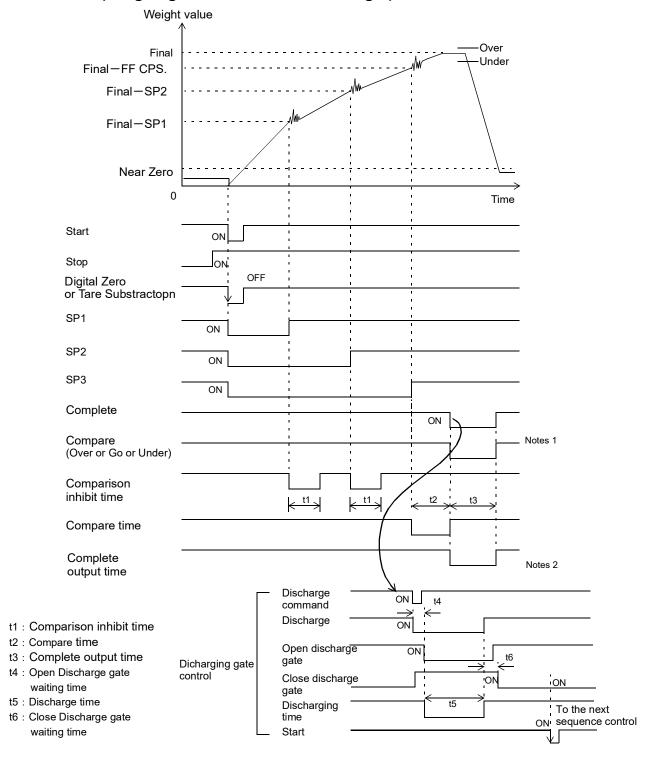
- ♦ The "Auto Jog" of the sequence mode have to be set ON.
- ♦ The period of the output "Complete" signal is decided by selecting in "Complete signal output" of the Comparison mode.
- ♦ Sequence mode ignores the selections in "Upper/Lower Comparison Mode" and "Over/Under Comparison Mode" of the Comparison mode. Over/Under compares when the "Complete" output signal gets ON and weight value is held. Upper/Lower limit compares regularly.

8-11-4. Sequential discharge weighing (Weighing mode of Gross / Net weight)



- ♦ The period of the output "Complete" signal is decided by selecting in "Complete signal output" of the Comparison mode.
- ♦ Sequence mode ignores the selections in "Upper/Lower Comparison Mode" and "Over/ Under Comparison Mode" of the Comparison mode. Over/Under compares when the "Complete" output signal gets ON and weight value is held. Upper/Lower limit compares regularly.

8-11-5. Sequential with discharging gate control (Weighing mode of Gross / Net weight)



- ♦ The period of the output "Complete" signal is decided by selecting in "Complete signal output" of the Comparison mode.
- ♦ Sequence mode ignores the selections in "Upper/Lower Comparison Mode" and "Over/ Under Comparison Mode" of the Comparison mode. Over/Under compares when the "Complete" output signal gets ON and weight value is held. Upper/Lower limit compares regularly.

8-11-6. Operation of a discharge gate

1. Confirm the Close Discharge Gate input signal is ON at start weighing sequence. If the input is OFF, sequence error 9 is indicated.

The error display is reset after Close Discharge Gate signal turns ON.

- 2. Confirm the Close Discharge Gate input signal keeps ON, until Complete output signal turns ON. During this period if the input is OFF, sequence error 6 is indicated and stops weighing.
- 3. After the Complete output signal turns ON, triggering Discharging Command goes to ON. Then the Discharge output signal turns ON.
- 4. After the Discharge output signal turns ON, if the Open Discharge Gate does not turn ON after the Discharge Time plus 2 seconds, the sequence error 8 is indicated. ($t4 \ge t5 + 2s$)

The error display is reset after Open Discharge Gate signal turns ON.

- 5. After the Open Discharge Gate turns ON and the Discharging time (t5) expires, the Discharge signal turns OFF.
- 6. After the Discharge output signal turns OFF and Discharging time plus 2 seconds has passes, if the Close Discharge Gate input does not turn ON, sequence error 9 is indicated. ($t6 \ge t5 + 2s$)

The error display is reset after Close Discharge Gate signal turns ON.

7. While the Close Discharge Gate input signal turns ON, the weighing cycle is finished.



After feeding, during the operation of Discharge gate control, input "STOP" signal could not stop the operation.

8-11-7. Compulsory discharging (Weighing mode of Gross / Net weight)

- 1) Compulsory discharging is carried out when the sequence error Err1 ~ 7 happen or weighing is not carried out.
- 2) The sequence error is reset by shorting (OFF → ON) pin 30 (Compulsory Discharging Command) to COM and the Discharge (pin 42) signal turns ON.
- 3) Confirmation of the Discharge Gate (Open & Close) input is carried out in the same way as the normal discharge.
- h) Discharge gate Control
- i) Discharging Time

Operation

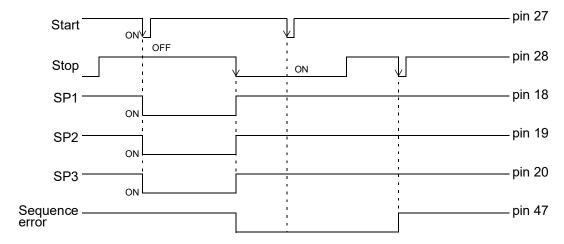
- h) MODE → SEQUENCE MODE → DISCHARGE GATE CONTROL → Select ON/OFF → OK
- i) MODE → SEQUENCE MODE → PAGE → DISCHARGING TIME → Input 0.0-9.9 → OK

8-11-8. Stop signal

Except sequence error 3 when errors happen, ON \rightarrow OFF the Stop signal, re-input Start signal.

When sequence error 3 happens, need to find out the reason caused Near Zero alarm and solves it at first, refer to manual regarding to Digital Zero, then $ON \rightarrow OFF$ the Stop signal, re-input Start signal.

Stop signal



8-12. Net Over / Gross Over

♦ Conditional Formula

Net Over When Net Weight > Set value of Net Over, OFL 1 is displayed. Gross Over When Gross Weight > Set value of Gross Over, OFL 3 is displayed.

- a) Net Over
- b) Gross Over

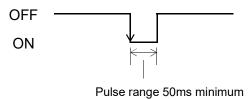
Operation

- a) MODE → CALIBRATION →NET OVER → Input 0-99999 → OK
- b) MODE → CALIBRATION → PAGE →GROSS OVER → Input 0-99999 → OK

9. ACCUMULATION CONTROL FUNCTION

The weight value can be accumulated to each ingredient code number. When Auto Accumulation is selected in Function setting mode, after Complete output signal gets ON the weight value will be added, otherwise by Accumulation Command via pin 8 of Control I/O on the rear panel.

Accumulation command (pin 8)



The accumulated weight could be Gross or Net weight, which is selected in Over / Under Comparison of the Comparison Mode.

9-1. Accumulation Command

Select to receive the accumulation command regularly (REGULARLY) or to receive it only when the indicated value is stable (IN STABLE MODE).

Operation

```
MODE → EXTENDED FUNC. → ACCUMULATION COMMAND → Select → REGULARLY/ INSTABLE MODE → OK
```

9-2. Accumulation Clear

Clear Accumulated Data (times, accumulation value and statistical data) for the selected Code.

Operation

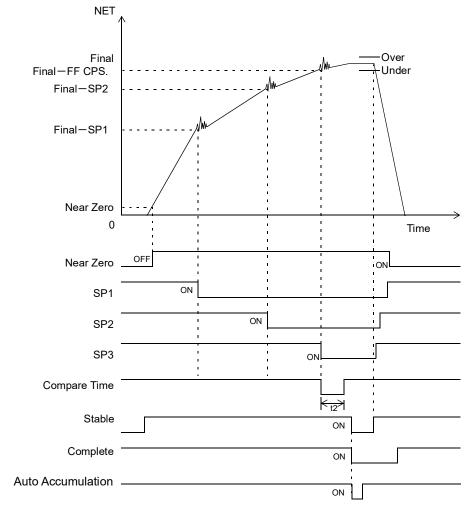
```
MODE \rightarrow EACH CODE \rightarrow \leftarrow or \leftarrow PAGE\rightarrow ACCUM. CLEAR Select \rightarrow NO/ YES \rightarrow OK
```

9-3. Auto Accumulation Command

When Complete output signal turns ON, do auto accumulation to the active weighing code, value, times and statistical data. Also send out auto printer command via SI/F and SI/FII interfaces.

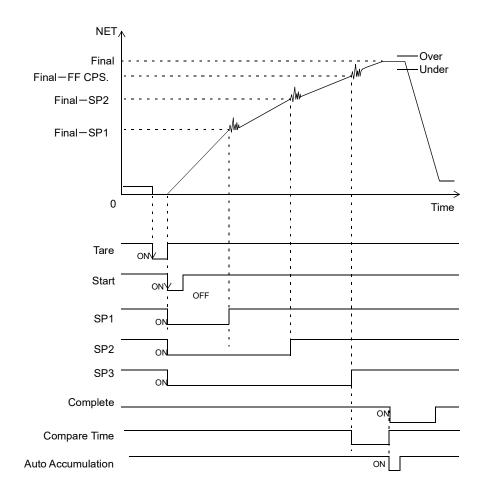
But if the weighing result is negative value, over scale or selected comparison OFF in Over/Under Comparison of the Function, F805AT-MD do not do accumulation.

1) Simple comparison command



t2: Compare Time

2) Sequence control



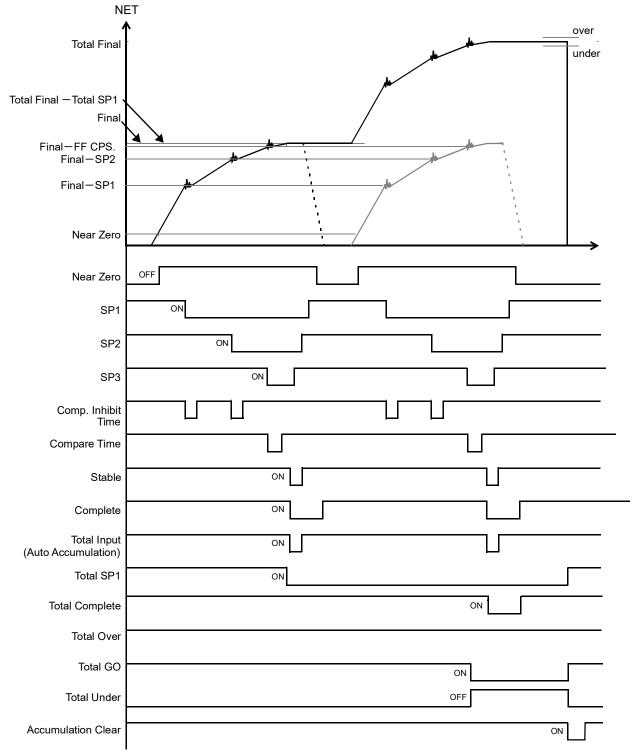
Regarding Simple Comparison Control and Sequence Control and Sequence with Judgment refer to (p.65 「Simple Comparison Control and Sequence Control」)

Operation

 $\label{eq:mode_solution} \mathsf{MODE} \to \mathsf{FUNCTION} \to \mathsf{AUTO} \ \mathsf{ACCUM}. \ \mathsf{COMMAND} \to \mathsf{Select} \ \mathsf{ON} / \ \mathsf{OFF} \to \mathsf{OK}$

9-4. Total Final / Total SP1 / Final / SP2 / SP1 / FF CPS. / Over / Under

Simple comparison control (without SP0 ON/OFF, Over/Under comparison → Total)



Control signal is outputted from the control panel connector depending on the value set here.

Setting value of Multi Draft Weighing

Setting	Display	Conditional formula
Total SP1 Output	TOTAL	Total weight \geq Total final setting value $-$ Total SP1 setting
	SP1	value
Under	UNDER	Total weight < Total final setting value — Under setting value
Over	OVER	Total weight > Total final setting value + Over setting value
Go	GO	Total final setting value $+$ Over setting value \ge Total weight \ge
		Total final setting value — Under setting value

Over/Under output performs the operation of comparison judging when Total is selected in Over/ Under Comparison .

The system can stores 100 types (100 codes) of setting values internally and controls each of them.

Total final/ Total SP1 (input range 0~999999)
Final/ SP2/ SP1 (input range 0~99999)
FF CPS (input range 0~9999)
Over/ Under (input range 0~999)

Operation

```
MODE → EACH CODE → (Code Selection) → PAGE → TOTAL FINAL → Input 0~999999 → OK

MODE → EACH CODE → (Code Selection) → PAGE → TOTAL SP1 → Input 0~999999 → OK

MODE → EACH CODE → (Code Selection) → FINAL → Input 0~99999 → OK

MODE → EACH CODE → (Code Selection) → SP2 → Input 0~99999 → OK

MODE → EACH CODE → (Code Selection) → SP1 → Input 0~99999 → OK

MODE → EACH CODE → (Code Selection) → FF CPS. → Input 0~9999 → OK

MODE → EACH CODE → (Code Selection) → OVER → Input 0~9999 → OK

MODE → EACH CODE → (Code Selection) → OVER → Input 0~999 → OK
```

9-5. SP0

1 step (SP0) weighing control enables to perform more speedy weighing in Multi-Draft weighing instead of usual 3 steps (SP1, SP2, SP3) weighing control.

This function is effective within the range of Weight value \geq Final setting value – SP0 setting value

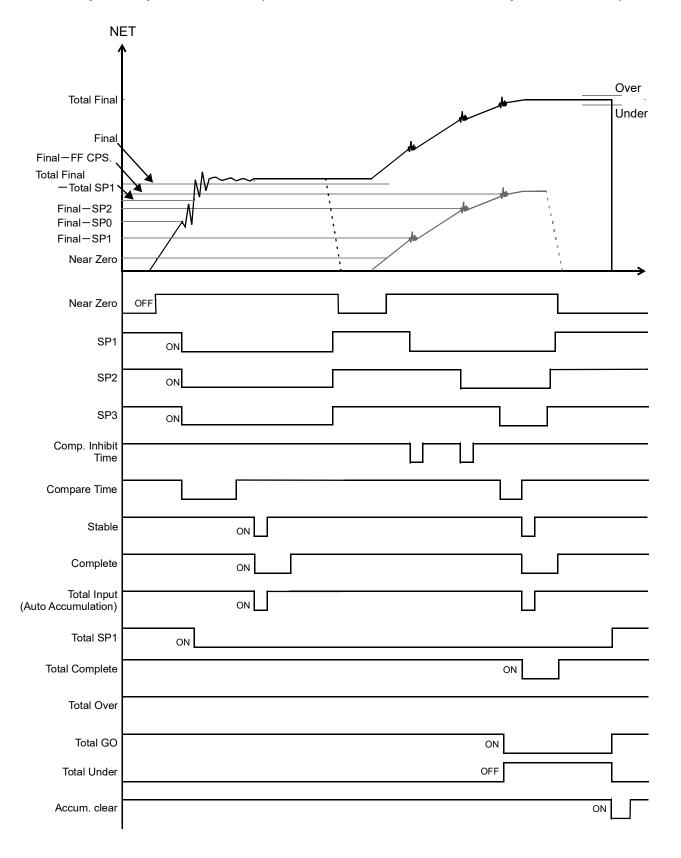
Setting	Display	Conditional formula
SP1 output	SP1	Weight value \geq Final setting value $-$ SP0 setting value
SP2 output	SP2	Weight value \geq Final setting value $-$ SP0 setting value
SP3 output	SP3	Weight value \geq Final setting value $-$ SP0 setting value

Operation

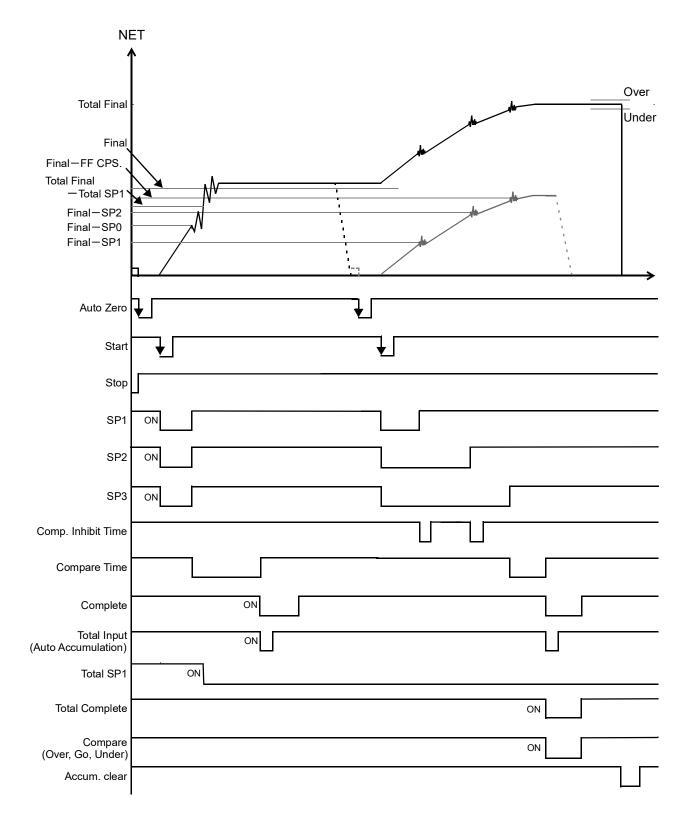
 $\mathsf{MODE} \to \mathsf{EACH}\ \mathsf{CODE} \to (\mathsf{Code}\ \mathsf{Selection}) \to \mathsf{PAGE} \to \mathsf{SP0} \to \mathsf{Input}\ \mathsf{0} \text{$^\circ$} \mathsf{99999} \to \mathsf{OK}$

MODE → EXTENDED FUNC. → SP0 MODE → Select INHIBIT or EFFECT → OK

Simple Comparison Control (with SP0 ON/OFF, Over/ Under comparison → Total)



Sequence Control (with SP0 ON/OFF, Over/ Under comparison → Total)



9-6. Auto Final Tuning

The function enables to perform more accurate weighing in Multi-Draft Weighing for automatically correcting the error to Total final.

Weight value discharged in the weighing control or Final setting value is adjusted to the rest of Total times

$$\begin{tabular}{lll} \hline Value adjusted to Final setting \\ \hline \hline \hline $\operatorname{Total\ final-Total\ weight}$ \\ \hline \hline \hline $\operatorname{Rest\ of\ Total\ times}$ & - Final\ setting\ value\ \Big(<\ Final\ setting\ value\times0.1\ \Big)$ \\ \hline \end{tabular}$$

This correcting function can be operated when the rest of Total times to Total final is greater then 30% or 3 times and Total weight \geq Total final – Total SP1.

Or the corrected value is 10% of the Final setting value maximum.

Example:

(Ex)

Total final	100,000	Final	20,000
Total SP1	45,000	Times of Total	5

Total	Total	Error	Next Final
Times			
0	0	0	20,000
1	20,002	2	20,000
2	40,005	5	20,000
3	60,006	6	19,997
4	80,004	4	19,996
5	100,000	0	20,000

Operation

MODE \rightarrow EXTENDED FUNC. \rightarrow AUTO FINAL TUNING \rightarrow Select INHIBIT or EFFECT \rightarrow OK

9-7. Total Times

The F805AT-MD automatically set Total times from 0 to 99 according to Setting value of Total final and Setting value of Total final (Input is not available.).

When it cannot be divided by Final setting value or Total times is set over 99 times, F805AT-MD automatically adjust the setting value under the conditions below.

1 When Total final is inputted and Final is zero.

Total final can not be inputted when Final is zero.

Input Final value beforehand.

2 When Total final is inputted and Final is not zero.

Ex. 1) When Final is 5000, 50000 is inputted to Total final.

$$50000/5000 = 10$$

F805AT-MD automatically set the batch counts to 10.

Ex. 2) When Final is 6000, 50000 is inputted to Total final.

$$50000/6000 = 8.3333$$

F805AT-MD round up the fraction and automatically set the batch counts to 9.

$$50000/9 = 5555.5555$$

F805AT-MD round up the fraction and automatically set the Final batch 5556.

The result is $5556 \times 9 = 50004$ for Total final 50000.

3 When a certain figure is inputted to Final whereas Total final is 0.

Automatic input to Total final is not conducted. (It remains 0.)

4 When a figure is inputted to Final and Total final is not 0.

The condition is the same as condition 2 above.

5 When Total times is above 99 times,

Total times is automatically set 99 and Total final = Final setting value×99.

However, case 2 and 4 when Auto final tuning is set Effective, the Total final is not set automatically.

9-8. Total Complete

When Final weighing for Total times is performed and the last Total signal (External input, Auto Total) is inputted, Multi Draft weighing is completed and Total complete signal is outputted (Control connector pin47).

The length of output time is the period set in Complete output time. (Total complete is operated no relation with the setup in Complete signal output mode.)

9-9. Smooth Display of Total Value

Total value of Smooth display

Total value display = Total value + Weight under weighing

Total value of non Smooth display

Total value display = Total value

In Final weighing control, Smooth display is carried out under the conditions below.

■ Simple comparison Mode

Smooth display is carried out by $ON \rightarrow OFF$ edge of Near Zero.

Smooth display can not be carried out when OFF is set in Near zero comparison.

■ Sequence Mode

Smooth display is carried out by ON of start signal.

(when Sequence mode is selected, Smooth display is always carried out.)

10. STATISTICS

The statistics data accumulated in F805AT-MD are displayed.

Weight values will accumulate when the Auto Accumulation Command is ON.

The statistics data (100 sorts) for each code are also displayed.

Average weight, Maximum weight, Minimum weight, General standard deviation, Sample standard deviation, Count of data, Latest data and Minimum – Maximum for Weighting value and Total value are displayed respectively.

Operation

However, when the weighing code designation is performed by external input, + - key cannot be operated.

The display on the screen is updated by switching code number through external input.

Calculation formula

$$n = Count = Count of data$$

$$\Sigma \chi = Accumulation = Grand total$$

$$\bar{\chi}$$
 = Average = Accumulation / Count = $\Sigma \chi$ / n

General standard deviation

$$\sigma_n = \sqrt{\frac{\sum_{i=n}^n (x_i - x_i)^2}{n}}$$

Use all the data of the finite population and fine the standard deviation of the population.

Sample standard deviation

$$\sigma_{n-1} = \sqrt{\frac{\sum_{i=n}^{n} (x_i - x_i)^2}{n-1}}$$

Use the sample data among the population and the standard decision of the population.

⟨Ex⟩

Tin	nes Accumu	Actual	average	Max.	Min.	Max.	General	Sample	
(n)	lation	Weighing				-Min.	S.D.	S.D.	
		Value							
		(latest)							
0	0.000	0.000	0.000	0.000	0.000	0.000	error	error	\leftarrow
1	20.050	20.050	20.050	20.050	20.050	0.000	0.000	error	a:
2	40.090	20.040	20.045	20.050	20.040	0.010	0.005	0.007	Clear
3	60.160	20.070	20.053	20.070	20.040	0.030	0.012	0.015	
4	80.240	20.080	20.060	20.080	20.040	0.040	0.016	0.018	lati
5	100.260	20.020	20.052	20.080	20.020	0.060	0.021	0.024	nur
6	120.260	20.000	20.043	20.080	20.000	0.080	0.027	0.030	Accumulation
7	140.270	20.010	20.039	20.080	20.000	0.080	0.028	0.030	⋖
8	160.250	19.980	20.031	20.080	19.980	0.100	0.033	0.035	
9	180.360	20.110	20.040	20.110	19.980	0.130	0.039	0.042	
10	200.370	20.010	20.037	20.110	19.980	0.130	0.038	0.041	
8	160.250	19.980	20.031	20.080	19.980	0.100	0.033	0.035	
9	180.360	20.110	20.040	20.110	19.980	0.130	0.039	0.042	
10	200.370	20.010	20.037	20.110	19.980	0.130	0.038	0.041	

11. GRAPHIC DISPLAY

Gross weight or Net weight can be drawn in graphics.

11-1. Graphic Drawing Point

X-axis: X-axis is for time setting.

One displayed drawing is between inputting start to the set time of X.

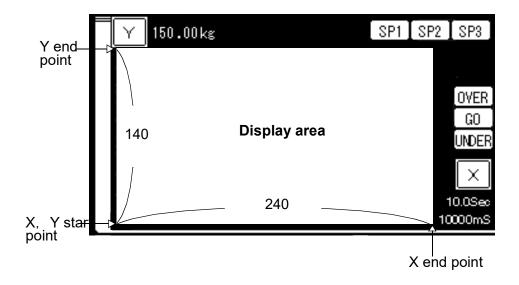
Drawing is consisted of 240 points, except 0 point.

The set time is divided by 240 drawing points, and represented value of each time will be shown on the graph screen.

Y-axis: Y-axis is for load setting.

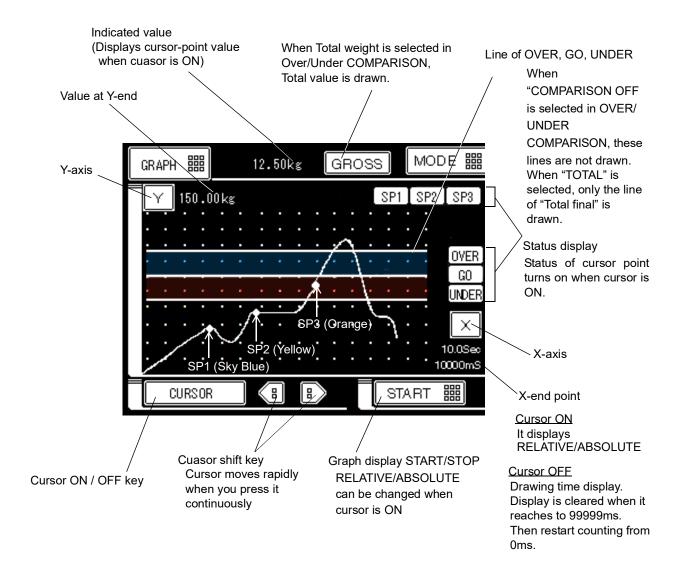
It shows the loads between the start set point to the end.

Drawing is consisted of 140 points, except 0 point.



11-2. Graphic Display

When you press MESSAGE on the Message Screen, it change to [GRAPH].

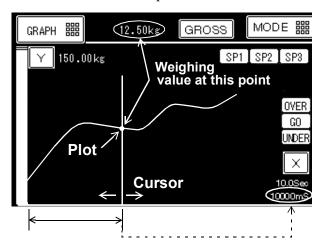


11-2-1. Relative time / Absolute time

"START" display changes to RELATIVE or ABSOLUTE when the cursor is ON.

ABSOLUTE Time

The time between start to the cursor point shows on the button of the right.

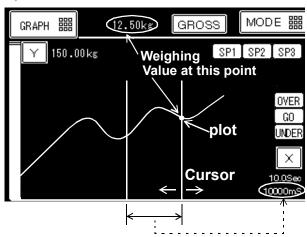


* The color of plot on the cursor is corresponded to the color of Over Go and Under.

It shows green when Over, Go and Under output signals are OFF.

RELATIVE Time

The time (ΔT) between the two cursors shows on the button of the right.



Only the plot on the intersection of the movable cursor with wave displays on the top.



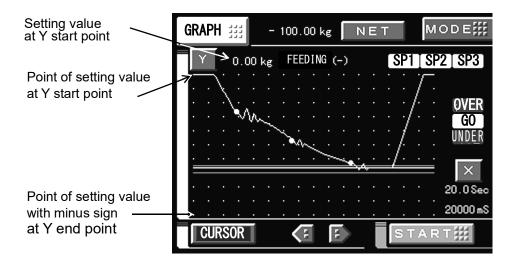
The graphics drawn is always initialized (cleared) when any setting below is changed.

- *Setting in Sequence mode (Simple comparison and Sequence mode)
- *Setting in Graph setting
- *Weighing code
- *Setting in Each code except FF CPS. REGU., Auto Jog Timer and FF CPS.

11-2-2. Graphic drawing of discharge control

When conducting Discharge control in NET weighing, and Net weight with minus sign is selected, Y end point and Y start point are displayed on the lower part and upper part of the graphic screen respectively.

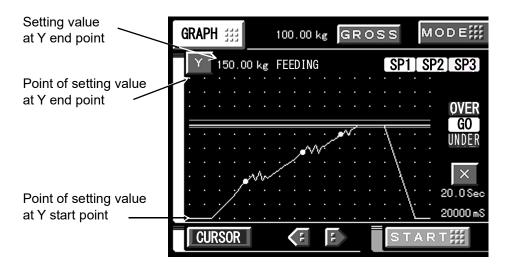
"Discharge (-)" is displayed on the upper part of the screen then the sign of setting value at Y end point and setting value of trigger level are reversed (as minus data).



When conducting Feeding control, Y start point on the lower part and Y end point on the upper part of the screen are displayed.

"Feeding" is displayed on the upper part of the screen.

When - Sign OFF is selected during Discharging, "Discharge (+)" is displayed on the upper part of the screen. Whereas the display regarding Y axis are as same as those of Feeding.



11-2-3. Graphic mode

Select from Single, Continuity or Level.

Single : Only draws the line once to X End Point by pressing

START 闘 or external input.

Continuity : Start drawing by pressing START ■ or external input then

repeat drawing continuously until STOP III is pressed or

externally inputted.

Level $(\underline{\uparrow})$ +exterior : Start the level detection by external input or START . When

the indicated value exceeds the setting value of trigger level, starts

the drawing then draws the line to X End Point once.

Level (♣)+ exterior : Start level detection by external input or START \equiv | . When the

indicated value passes the setting value of trigger level, starts

drawing then draws the line to X End Point once.

Level $(\underline{\uparrow})$: When the indicated value exceeds the setting value of trigger level,

starts the drawing then draws the line to X End Point once.

Level (1): When the indicated value passes the setting value of trigger level,

starts the drawing then draws the line to X End Point once.

Operation

MODE → GRAPH SETTING → GRAPHIC MODE Select from SINGLE / CONTINUITY / LEVEL($\frac{1}{1}$) + EXT / LEVEL($\frac{1}{1}$) / LEVEL($\frac{1}{1}$) → OK

11-2-4. Trigger level

Set the Trigger Level when the level is set in graphic mode.

(input range $/ 0 \sim 999999$)

Operation

MODE → GRAPH SETTING → TRIGGER LEVEL → Input 0 ~ 99999 → OK

11-2-5. X (Time axis)-End point

Set the range of X-axis (Time axis). (input range $/1.2 \sim 99.9$)

Operation

MODE → GRAPH SETTING → X END POINT → Input 1.2 ~ 99.9 → OK

or X on the Graphic Screen → Input 1.2 ~ 99.9 → OK

11-2-6. Y (Weight)-Start point

Set the Y-axis (Weight axis) start point. (input range $/ 0 \sim 999998$)

Operation

MODE → GRAPH SETTING → Y START POINT → Input 0 ~ 999998 → OK

11-2-7. Y (Weight) End point

Set the full scale of Y-axis (Weight axis). (input range $/ 1 \sim 999999$)

Operation

MODE → GRAPH SETTING → Y END POINT → Input 1 ~ 999999 → OK

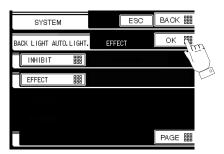
or Y on the Graphic Screen \rightarrow Input 1 \sim 9999999 \rightarrow OK

When Y End Point \leq Y Start point is set, the value at Y Start Point equals the value at Y End Point-1.

12. SYSTEM MODE

12-1. Back Light Auto. Light.

When 'EFFECT' is selected in Back Light Auto. Light., in Simple comparison mode after weighing and complete output signal turns ON; in Sequence control mode after input Start signal the back light on.



Operation

MODE → PAGE → SYSTEM → BACK LIGHT AUTO. LIGHT. → Select Effect/ Inhibit → OK

* Ignore the selection here, when F805AT-MD power on and touch screen the Back Light turns on.

12-2. Back Light Low Time

The function which the back light of screen is switched between Light and Dark when touch screen has not been used for a certain period of time. Dark lighting will not be carried out if it sets up in 00 minute. (input range $/0 \sim 99$)

Operation

MODE → PAGE → SYSTEM → BACK LIGHT LOW TIME → Input 0 ~ 99 → OK

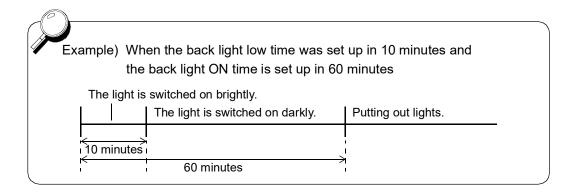
12-3. Back Light ON Time

The function which turns off the back light of screen when touch screen has not been used for a certain period of time.

The back light will not turns off if you set 00. (input range / 0 \sim 99)

Operation

MODE → PAGE → SYSTEM → BACK LIGHT ON TIME → Input 0 ~ 99 → OK



12-4. Self-Check

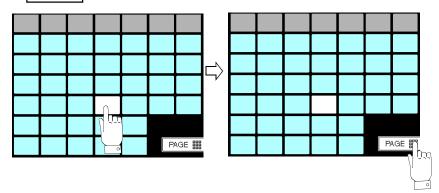
The function which checks the operation status of F805AT-MD itself. If you find any problem, please contact us or our sales agent for repairing.

Operation

1) Touch panel check

Each blue square turns yellow when you press it. Check whether the each square reacts correctly.

Press PAGE to proceed to next page.



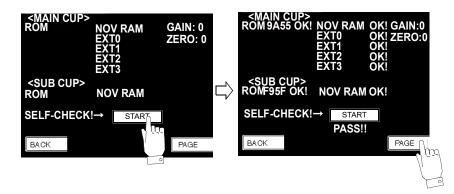
2) Memory check

Start NOV. and RAM. checking by pressing START

PASS is displayed when it is working normally. NG is displayed in the reverse case.

Press PAGE to proceed to next page when you finished the checking.

(Press BACK to return to the previous page).



3) Display check

Start checking by pressing each button (BACK LIGHT, BRIGHTNESS, COLOR or LINE).

Press BACK - LIGHT tag, turns dark, touch screen returns to display check.

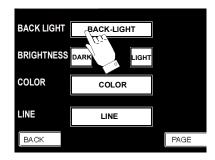
Brightness Screen turns lighter by pressing LIGHT. It turns darker by pressing DARK

Color Color changes in turn. White \rightarrow Black \rightarrow Red \rightarrow Green \rightarrow Blue.

Line Displays Lateral strip → Verticl strip in turn.

Press PAGE to proceed to the next page after checking each item respectively.

(Press | BACK | to return to the previous page).



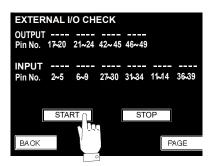
4) Input / Output check

Check external input / output signal.

Signal are outputted via pin $17 \sim 24$ and $42 \sim 49$ in turn of control I/O connector on the rear panel by pressing START . The output status "-" show "0".

Output signals are stopped by pressing STOP

The input status "-" show "0" when signals are inputted via control I/O pin $2\sim9$, $11\sim14$, $27\sim34$ and $36\sim39$ on the rear panel.



- 5) BCD out check (BCO)
- 6) BCD in check (BCI)
- 7) D/A check (DAC)

These are only indicated when option board is mounted.

- BCD output board check (BCO)

Check I/O signal of the BCD parallel data output interface.

Signals are outputted via pin $2\sim18$ and $20\sim26$ in turn of BCD output connector on the rear panel by pressing $\boxed{\text{START}}$.

The indication of output status "-" changes to "0".

Output signals are stopped by pressing STOP

The input status "-" shows "0" when signals are inputted via pin $27 \sim 34$ of the BCD output connector on the rear panel.

BCD input board check (BCI)

Check I/O signal of the BCD parallel data input interface.

Signals are outputted via pin $27 \sim 34$ in turn of the BCD input connector on the rear panel by pressing $\boxed{\text{START}}$.

The output status "-" show "0".

Output signals stop by pressing STOP

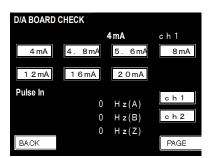
The input status "-" show "0" when signals are inputted via pin $2 \sim 18$ and $20 \sim 26$ of the BCD input connector on the rear panel.

D/A board check(DAC)

Check the output of D/A converter.

Select channel of output signal by pressing chi key.

Indicated current is outputted by pressing 4 mA ~ 20 mA



* Pulse input is not used here.

12-5. Language

English version or Japanese version can be selected by pressing LANGUAGE tab of the System mode.

Operation

MODE → PAGE → SYSTEM → LANGUAGE → Select ENGLISH / JAPANESE → OK

^{*} There are no self-check screens concerning SI/F, SIF II, RS-232C and RS-485.

12-6. Password

To release the software Lock, release the alarm of Near Zero and initialize instrument by entering the password.

Operation

MODE → PAGE → SYSTEM → PASSWORD → Input 1269 → OK → PASSWORD → · · · · · ·

Input password "1269" releasing the software lock;

When input password "1111" releasing the alarm of Near Zero;

When input password "6842" initializing set value of the instrument.

(The memorized setting value in NOV. and RAM. can not be changed by above processing.)

12-7. Lock (soft)

Lock for protecting from false operation, refer to the list of setting items on page 178 regarding effective setting value for LOCK (soft).

Select from ON / OFF.

Operation

MODE → PAGE → SYSTEM → LOCK (soft) → Select ON / OFF → OK



Unless inputting password 1269 beforehand, LOCK OFF cannot be executed.

13. CONTROL I/O(EXTERNAL SIGNAL)

13-1. Control Connector-pin Assignment

DDK 57-30500 plug is included

1	*	COM	26	*	COM
2	in	G/N	27	in	Start *1
3	in	D/Z ON	28	in	Stop *2
4	in	Tare ON	29	in	Discharging Command *3
5	in	Tare OFF	30	in	Compulsory Discharging Command*4
6	in	Hold or Judge	31	in	Open Discharge Gate *5
7	in	Feed / Discharge	32	in	Close Discharge Gate *6
8	in	Accumulation Command	33	in	Code No.Designation Selection
9	in	Total Clear	34	in	Accumulation Clear
10	*	COM	35	*	COM
11	in	Code No. Designation 1	36	in	Code No. Designation 10
12	in	Code No. Designation 2	37	in	Code No. Designation 20
13	in	Code No. Designation 4	38	in	Code No. Designation 40
14	in	Code No. Designation 8	39	in	Code No. Designation 80
15	*	COM	40	*	COM
16	*	COM	41	*	COM
17	out	Near Zero	42	out	Discharge *7
18	out	SP1	43	out	Lower Limit
19	out	SP2	44	out	Upper Limit
20	out	SP3	45	out	Stable
21	out	Complete	46	out	Weight Error
22	out	Under	47	out	Total Compl
23	out	Over	48	out	Final / Sequence Error *8
24	out	Total SP1	49	out	Run
25	*	COM	50	*	COM

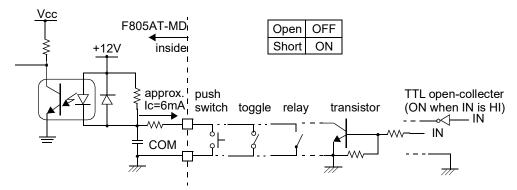
[•] The COM(common) terminals are connected inside.

[•] The power voltage is not outputted.

^{• *1} to *8 are effective in the Sequence Mode.

13-2. Equivalent Circuit(Input)

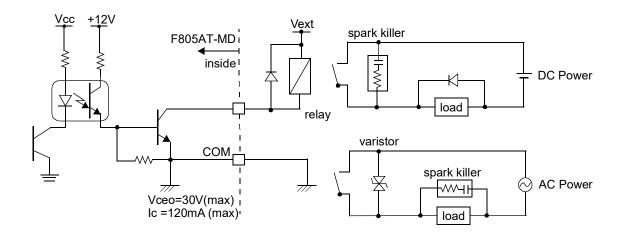
Signal are inputted by shorting or opening input and COM terminals. A relay, switch or transisitor may be used for this application.



- Do not apply external voltage to the signal input circuit.
- Use external elements which withstand Ic=10mA.
- Leakage of external elements must be within 100μA.

13-3. Equivalent Circuit(Output)

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



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 spark killer to the relay circuit as shown in the draft so that to reduce noise trouble and extend the life of relay.

13-4. External Input Signal

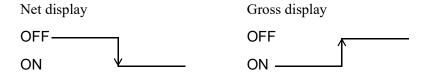
13-4-1. Gross / Net switching (G/N) <edge input> <level input> [pin 2]

Edge input mode (Setting G/N by tag input)

The display value is switched between Gross and Net by pressing GROSS/NET or through the External Input Signal.

When External Input pin 2 is shorted to COM (OFF \rightarrow ON) the Net weight is displayed.

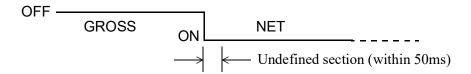
When External Input pin 2 is open to COM (ON \rightarrow OFF) the Gross weight is displayed.



Level input mode (Setting G/N by external input)

When level input is ON, Net weight is displayed.

When level input is OFF, Gross weight is displayed.



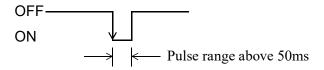
13-4-2. Digital Zero (D/Z ON) <edge input> [pin 3]

When External Input pin 3 is shorted to COM (OFF \rightarrow ON) it brings the Gross weight to Zero.

This function works within the range of Digital Zero Regulation Value.

If these values exceed the range, the ZALM (Zero Alarm) turns red.

DZ button is also effective for the same operation.

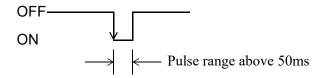


13-4-3. Tare subtraction (TARE ON) <edge input> [pin 4]

Pressing TARE brings the Net weight to zero.

When External Input pin 4 is shorted to COM (OFF \rightarrow ON) it brings the Net weight to zero. TARE key is also effective for the same operation.

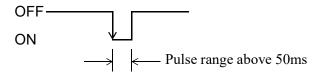
According to the setting of One-Touch Tare Subtraction if it is selected accepting Tare subtraction in weight gets stable, it will be only works when the indicated value is stable.



13-4-4. Tare reset (TARE OFF) <edge input) [pin 5]

When External Input pin 5 is shorted to COM (OFF \rightarrow ON) it brings the Net weight equal to Gross weight. This does not apply if Preset Tare Weight used.

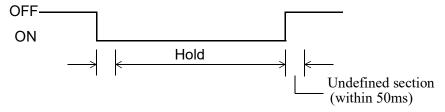
TARA RESET key is also effective in detail please refer to page 49.



13-4-5. Hold <level input> [pin 6]

The Weighing value will be in a hold mode if pin 6 is shorted to COM. Setting Mode Comparison, Over/Under Comparison Mode and Upper/Lower Limit Comparison Mode must be set to Comp. regularly.

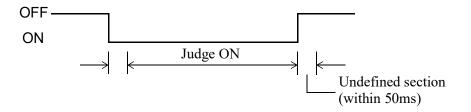
* "HOLD" turns on in a Hold mode.



- * If Setting Mode Comparison, Over/Under Comparison Mode and Upper/Lower Limit Comparison Mode are not set to Comp.regulary, then they can only be activated by external input, that is JUDGE.
- * Hold function is ineffective in Sequence Mode.

13-4-6. Judge <level input> [pin 6]

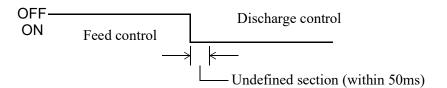
Judging Mode is activated by shorting pin 6 to COM. Setting Mode Comparison, Over/Under Comparison Mode and Upper/Lower Limit Comparison Mode must be set to EXT. Judging on.



^{*} Judge function is ineffective in Sequence Mode.

13-4-7. Feed/ Discharge < level input> [pin 7]

Feed or Discharge is accessed by shorting or opening pin 7 to COM. Setting Mode Comparison, Discharge Control must be set to External.



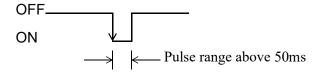
13-4-8. Accumulation command <edge input> [pin 8]

The weight value is added to Total value and Accumulation value currently selected code as well as times is counted by $ON(OFF \rightarrow ON)$ signal through external input.

The weight value added to is depending on the weight value set in Comparison of weighing control.

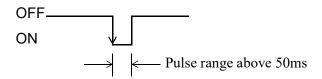
Only this function works according to the setting of Accumulation command when indicated value is stable.

* A negative weighing value is not add to the Accumulation value or count.



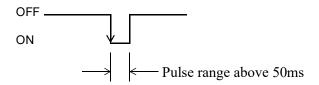
13-4-9. Total clear<edge input> [pin 9]

Total and Total times for currently selected code are cleared by ON signal(OFF \rightarrow ON) through external input.

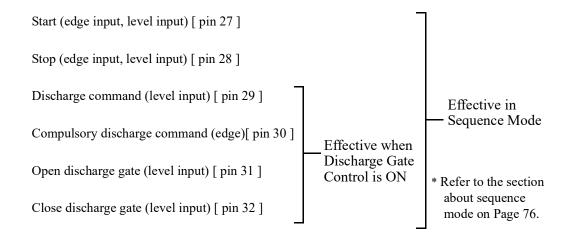


13-4-10. Accumulation clear (edge input) [pin 34]

Accumulation, Total, Accumulation count total times and the result of calculation for currently selected code are cleared by ON signal through external input.



13-4-11. Input signal used in sequence mode



13-4-12. Code No. designation < level input> [pin 11 \sim 14, 36 \sim 39]

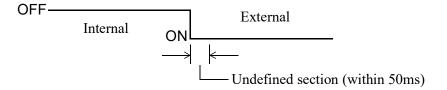
Appoint Code No. 80 40 20 10 8 4 2 1 For 10 numerical position For 1 numerical position
$$\rightarrow$$
 00 \sim 99

* Effective when setting the Weighing Code Selection/ Setting Code Selection by external input.

13-4-13. Code No. designation selection <level input> [pin 33]

Code numbers are inputted through the key if pin 33 is open to COM. Code numbers are inputted through the Control I/O if pin 33 is shorted to COM.

Key input when it is OFF. External input when it is ON.



13-5. External Output Signal

13-5-1. Near zero [pin 17]

When weighing value \leq Near Zero set value, the Near Zero output turns ON.

The weighing value could be Gross, Net, Absolute Gross, Net or Comparison OFF that are selected in Near Zero Comparison of the Comparison Mode.

13-5-2. Lower limit, Upper limit [pin 43, 44]

The Lower Limit output turns on when weight value < Lower Limit set value.

The Upper Limit output turns on when weight value > Upper Limit set value.

The weight value here could be Gross or Net that are selected in U/L Limit Comparison;

Also, could select Comparison regularly, or Comparing when external judging input is on (EXT. JUDGING ON) in the U/L Limit Comp. Mode of the Comparison Mode.

* When Total is selected in U/L Limit Comparison, the setting value of Upper/Lower Limit is increased by ten.

13-5-3. Stable [pin 45]

This output turns on when the weighing value is stable.

* Refer to 「Motion Detection」 on page 45 for details.

13-5-4. Weight error [pin 46]

This output turns on when the LOAD, -LOAD, OFL1, OFL2, OFL3 happen or Z.ALM turns ON.

13-5-5. RUN [pin 49]

The output turns on when F805AT-MD is ready to operate and external output is OFF in Total comparison.

13-5-6. SP1, SP2, SP3, Total SP1 [pin 18,19,20,24]

■ In simple comparison control mode

(available for 100 Code)

SP1 turns on when weight value \geq Final-Set Point 1

SP2 turns on when weight value \geq Final-Set Point 2

SP3 turns on when weight value \geq Final- FF CPS.

Total SP1 turns on when Total weight \geq Total final setting value - Total SP1 setting value

■ In sequence control mode

In Sequence Control Mode, the weighing sequence is started at the ON edge of the start signal (OFF \rightarrow ON), SP1, SP2 and SP3 turn ON.

SP1 turns off when weight value \geq Final-Set Point 1

SP2 turns off when weight value \geq Final-Set Point 2

SP3 turns off when weight value \geq Final-FF CPS.

Total SP1 turns off when Total weight \geq Total final setting value - Total SP1 setting value

The weight value here could be Gross, Net or Comparison OFF that are selected in Over/ Under Comparison of the Comparison Mode.

13-5-7. Under, Over [pin 22,23]

■ In simple comparison control mode

The Under signal turns on when weight value < Final-Under.

The Over signal turns on when weight value > Final+Over.

The weight value could be the Gross, Net or Comparison OFF that are selected in Over/ Under Comparison of the Comparison Mode.

Also, it could be selected in "Compare regular", "Compare when the external judging input is on", or "Compare when the complete output signal is on and the weight value is hold" in the Over/Under Comp. Mode of the Comparison Mode.

■ In sequence control mode

The Under signal turns on when weight value < Final-Under.

The Over signal turns on when weight value > Final+Over.

In Sequence Control Mode, it is ignored the selection in Over/Under Comp. Mode, during complete output signal turns on while do Over/Under comparison. When Sequence with Judgment is used, during complete output signal turns on comparing while hold weight value.

13-5-8. Complete, Total complete [pin 21,47]

■ In simple comparison control mode

The timing of the output could be selected in Complete signal output of the Comparison Mode.

The choices are:

- 1. After Compare time is expired, only during complete output time the complete output signal is on.
- 2. After Compare time is expired and weight value becomes stable, only during complete output time the complete output signal is on.
- 3. After Go or Over/Under signal turns on and Compare time is expired or weight value becomes stable, only during complete output time the complete output signal is on.

The setting item for the duration of the complete signal is the same category.

■ In sequence control mode

With judgment (The Judging Times of the Sequence Mode is not set to 0) Refer to the explanation of Simple Comparison Control Mode.

Without judgment (The Judging Times of the Sequence Mode is 0) It is ignored the selection in Complete signal output of the Comparison Mode.When SP3 output signal has turned off (ON \rightarrow OFF), the Complete signal turns ON.

13-5-9. Error [pin 48]

■ In sequence mode

When an error has occurred in the Sequence Mode, The Error turns on.

- When Start signal turns on, the Stop signal turns on. "SEQ. ERR. 1"
- During weigh cycle, the Stop signal turns on. "SEQ. ERR. 2"
- "ZALM"(Zero Alarm) turns on according to the set AZ times. "SEQ. ERR, 3"
- During weigh cycle, Near Zero output signal turns off "SEQ. ERR. 4" (Only when at start, Near Zero confirmation ON is selected in Sequence Control.)
- During weigh cycle, the weighing value ≥ SP1 "SEQ. ERR. 5"
 (Only when at start, Weighing value confirmation ON is selected in Sequence Control)
 * SP1=Final Set point 1
- During weigh cycle, the Close Discharge Gate Signal turns off (stops weighing)

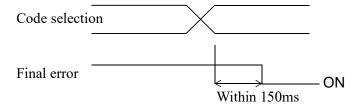
 "SEQ. ERR. 6"
- During discharge, the Stop signal turns on (stops discharge) "SEQ. ERR. 7"
- After Discharge output signal turned on, the Open Discharge Gate signal cannot turn on.

 "SEQ. ERR. 8"
- After Discharge output signal turned off, the Close Discharge Gate Signal cannot turn on. "SEQ. ERR. 9"
- * Concerning reset Sequence Error, refer to 「Squence Error (Error [Pin 47])」 on Page161.

■ Final error

When (Final-FF CPS.) < 0 Final Error output signal turns on, not only in Sequence Mode but also in Simple comparison control.

Output timing



In Sequence Mode, the Final Error output signal is on if after Start signal, the SP1, SP2, and SP3 output signal will not turn on.

Then Sequence Error 5 will be displayed.

13-5-10. Discharge [pin 42]

In Sequence Mode and Discharge Gate Control ON is selected, the durance of the discharging time follow the set value.

* Concerning the Time Chart, refer to 「Sequence Mode」 on Page 65.

14. INTERFACE

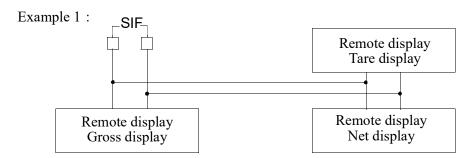
14-1. SI/F 2-Wire Serial Interface

This 2-wire serial interface is for connecting F805AT-MD to peripheral equipment such as printers or remote displays. No polarity is needed for this simple, low-cost installation. The transmitting distance is about 300m (328yds).

Connection

Up to 3 peripheral units can be connected in parallel.

The wire may be 2-core twisted or shielded cable. It should not run along side AC or other high-voltage wiring.



Up to 3 remote displays can be connected. The each display can display individual content according to the selection.

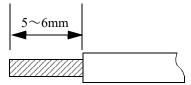


These indicated above are examples for the connection of Remote displays. Each display can select the data individually.

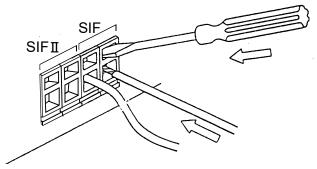
The Lock, SI/F. terminal on the rear panel is a Cage Clamp. Connection is simple and easy.

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

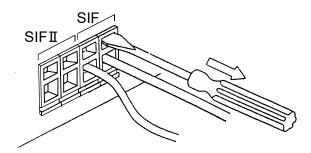
(2) Twist the bare wire to fit the terminal hole.



- (3) Insert the supplied screwdriver into the upper hole and lift upward.
- (4) Insert the twisted wires into the lower hole.



- (5) Pull the screwdriver out from the upper hole.
- (6) Make sure cable is clamped securely and does not come out with a slight tug.





- Cable can be from 24 to 14AWG (0.2 to 2.5m m²). Do not solder the cable wires or fix a solderless terminal.
- If several cables to be inserted to the same hole, twist those cable wires together and insert

Auto print command

The F805AT-MD gives an automatic print command to any device connected by SI/F interface.

In Simple Comparison Mode the automatic print command is sent when the Complete output signal turns ON. In Sequence with Judgement the automatic print command is sent when judgement output signals (Over, Go, Under) turn ON. In sequence without Judgement the automatic print command cannot be sent out.

Also, when weighing result is Negative or Over scale, the automatic print command can not be sent out.

14-2. SI/FII High Speed Bi-Directional 2- Wire Serial Interface

SF/FII is a high speed bi-directional serial interface for connecting F805AT-MD to various peripheral Devices. These include printers, remote displays, converters (D/A, BCD-IN, BCD-OUT, RS-232C) as well as PLC's (Mitsubishi CC-Link, Omron CompoBus/D, Yokogawa FAM3, Allen-Bradley Open DeviceNet).

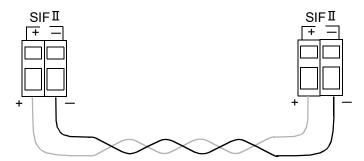
Up to 20 devices may be connected by 2-core parallel or shielded cable with polarity.

Connection

In this network up to 4 weighing controllers (specified by different ID numbers) are connected by SI/FII positive to positive, negative to negative.

The M350 printer serves up to 4 coded simultaneous sources, in one of 32 statistical categories. The LD517 remote display accumulates or sums up to 4 coded simultaneous sources.

Our converters (E924, E928, E930, E232) allow the 4 coded sources to communicate with PC's or PLC's.



Auto print command

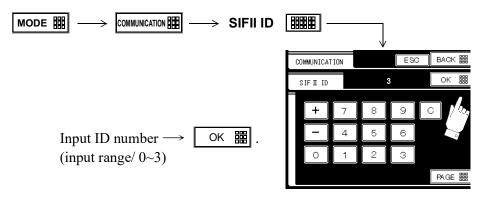
The F805AT-MD gives an automatic print command to any device connected by SI/FII interface.

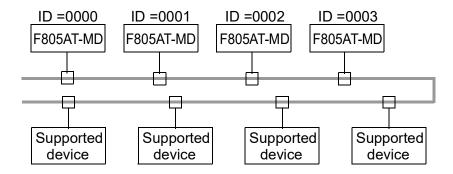
In Simple Comparison Mode the automatic print command is sent when the Complete output signal turns ON. In Sequence with Judgement Mode the automatic print command is sent when judgement output signal Over, Go or Under turns ON. In sequence without Judgement Mode the automatic print command cannot be sent out.

Also, when weighing result is Negative or Over scale, the automatic print command cannot be sent out.

ID Number setting

Set ID number for each F805AT-MD in the SIFII network.





14-3. RS-232C Interface

14-3-1. Communication specifications

1. Specifications

Signal level : Based on the RS-232C

Transmitting distance : Approx. 15m (16.4yd.)

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

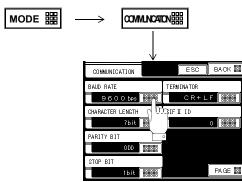
Adaptable plug: 9-pin D-SUB connector

* OMRON XM3D-0921 (Cover: XM2S-0913 with #4-40 screw) or its equivalent

1			6	in	DSR
2	in	RXD	7	out	RTS
3	out	TXD	8	in	CTS
4	out	DTR	9		
5	*	GND			

14-3-2. Setting values for RS-232C

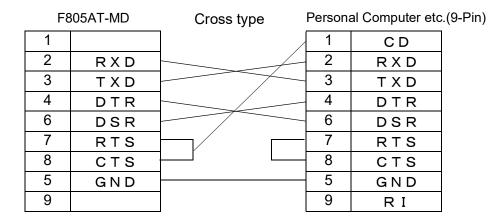
The initial set for RS-232C port of connecting Personal Computer and Sequencer should be as the same setting as F805AT-MD.

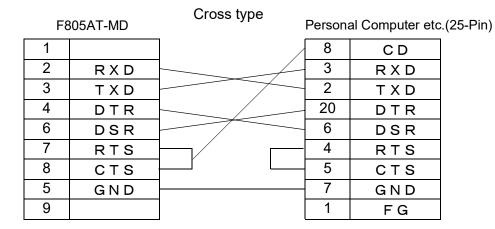


Set each item below.

- Baud rate
- · Character length
- Parity bit
- Stop bit
- Terminator

14-3-3. Cable





The above diagram is for connecting a personal 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.

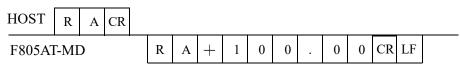
14-3-4. Sample program

This program enables to preset a tare weight in F805AT-MD then readout each net weight from F805AT-MD and displays it. (Because this program is only for N88-BASIC, it should be modified when you use other device.)

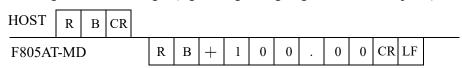
```
100 CLS
                                                  ODD
110 OPEN "COM: 071NN" AS #1
                                     'Parity
120
                                     'Data bit 7, Stop bit 1
130
                                     'Xon/Xoff Invalid, SI/SO Invalid
140 PRINT #1, "CD"
                                     'Display switchover Net Weight command
                                     'Tare Subtraction Reset Command
150 PRINT #1, "CF"
160;
200 INPUT "TARE weight =" ,TARE
210 IF TARE>99999 THEN GOTO 200
220 \text{ TARE} = STR$ (TARE)
230 TARE$ = RIGHT$ ( "0000" +RIGHT$ (TARE$, LEN(TARE$)-1), 5)
240;
250 PRINT #1,"W51" +TARE$
                                                'Preset Tare Weight Writing
260 PRINT #1,"W51" : INPUT #1,CHK$
                                                 'Preset Tare Weight Reading
270
                                                 'Setting Date Check
280 IF CHK$<> "W51"+TARE$ THEN PRINT "Missing data!" :GOTO 200
290;
300 PRINT #1, "RG" : INPUT #1,ST4$
                                                 'Status 4 Reading
310 PRINT #1, "RB": INPUT #1,NET$
                                                'Net Weight Reading
320 \text{ NET} = \text{VAL} (\text{RIGHT} \text{ (NET},7))
330 PRINT "Net weight =";
340 IF MID$ (ST4$,6,1)<> "0" THEN PRINT "Error"
                                 ELSE PRINT USING "###.##kg";NET
350 GOTO 300
```

14-3-5. Communication format

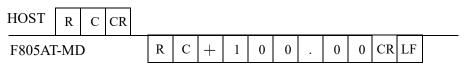
• Reading out the Gross weight (sign, 5-digt weighing value, decimal point)



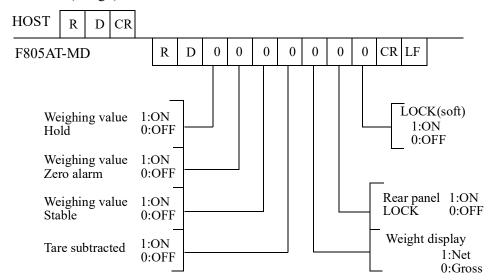
• Reading out the Net weight (sign, 5-digit weighing value, decimal point)



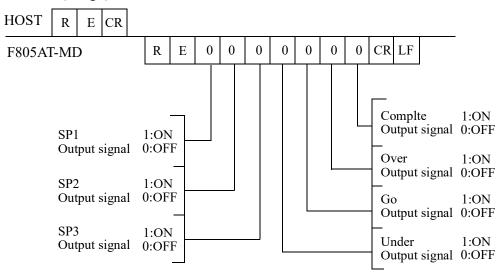
• Reading out the Tare (sign, 5-digit weighing value, decimal point)



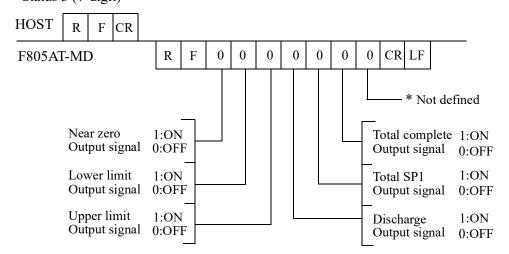
· Status 1 (7-digit)



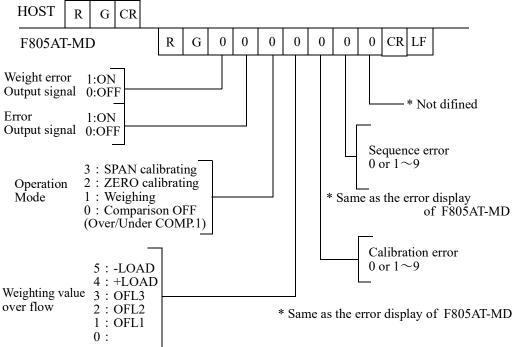
• Status 2 (7-digit)



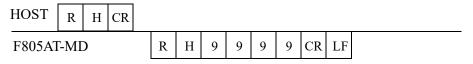
• Status 3 (7-digit)



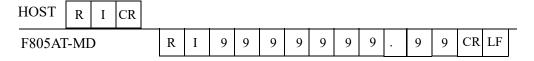
• Status 4 (7-digit)



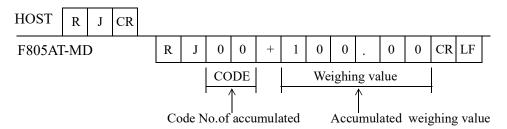
• Read out the Count of Data (accumulation times) (4-digit)



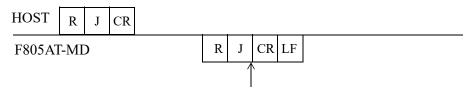
• Read out the accumulated value (9-digit, decimal point)



· Read out the accumulated weight

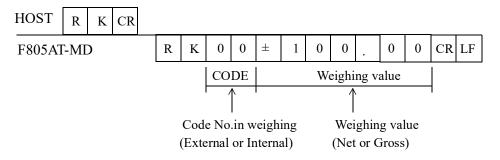


* Up to 256 data entries are stored in the memory buffer. Oldest data will be cleared when buffer is read.

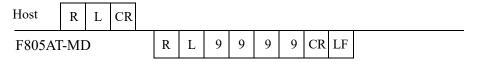


When there is no accumulated data in the buffer memory.

• Read out the weighing data



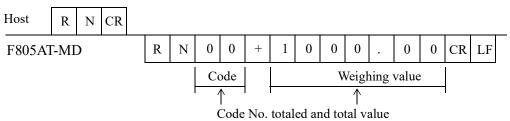
• Read out Accumulation count(4 digit)



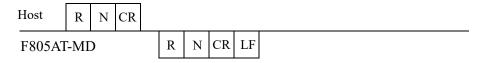
• Read out Accumulation value of Total(9 digit, decimal point)

Host	R	M	CR															
F805AT-MD			R	M	9	9	9	9	9	9	9	9	9	CR	LF			

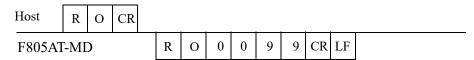
· Read out Total data



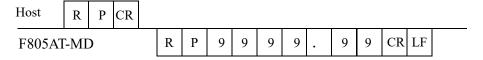
- * Up to 256 data can be stored in FIFO buffer. When data is reead out, the oldest data is erased. (first in, first out)
- Return data when there is no data totaled in FIFO buffer.



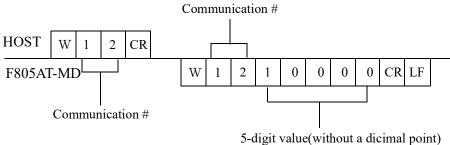
· Read out Total times(4 digit)



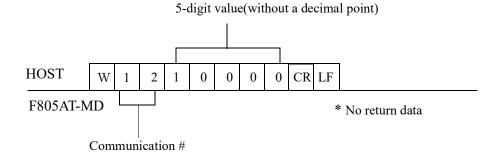
· Read out Total value(6 digit, decimal point)



- * When read out the data by RH, RI, RL, RM, RO, in advance select the code whose data is read out.
- Read out the set value (ex. the Final value)



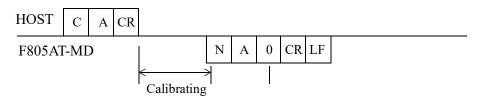
• Write in the set value (ex. the Final)



• Command (ex. Tare Subtraction)

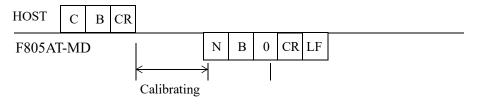


· Zero calibration



0 : Normally completed, $1\sim$ 9 : Error (same as the error display of F805AT-MD)

· Span calibration



0: Normally Completed, $1\sim 9:$ Error (same as the error display of F805AT-MD)

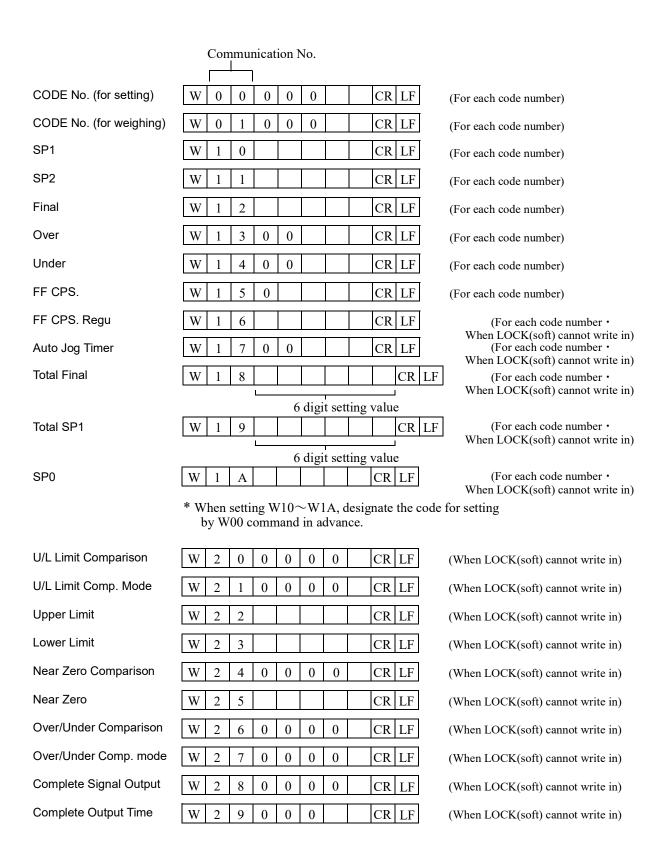
* Before sending this command, set the Capacity, Min. Scale division and Balance Weight.

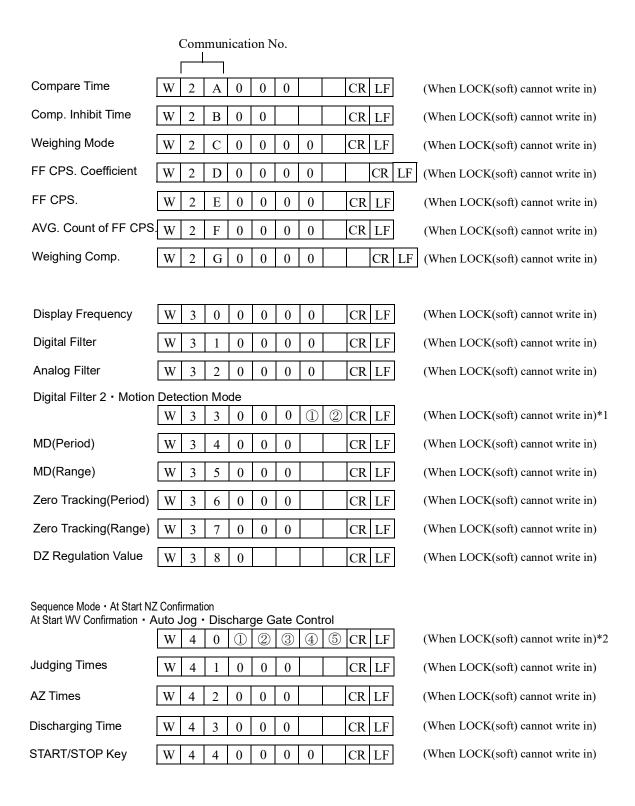
HOST	С	K	CR		
F805A7	-MI)		* No return date	

• Total data clear

HOST	С	L	CR	
F805A7	-MI)		* No return date

14-3-6. RS-232C Table for Reading out set value · Writing in command





Communication No. Preset Tare Weight • Gross/Net Selection • Discharging Control Sign TARE/DZ Key · GROSS/NET Key W 1 2 3 4 ⑤ CR LF (When LOCK(soft) cannot write in) *3 5 0 Preset Tare Value LF (When LOCK(soft) cannot write in) CR Auto Accum. Command W 5 2 0 0 0 0 CR LF (When LOCK(soft) cannot write in) Weighing Code Selection W 0 CR LF (When LOCK(soft) cannot write in) 5 3 0 0 0 (When LOCK(soft) cannot write in) **Setting Code Selection** W 5 4 0 0 0 0 CR LF Each Code Key W 5 5 0 0 0 0 CR LF (When LOCK(soft) cannot write in) Balance Weight Value W 6 0 CR LF (When LOCK(soft/hard) cannot write in) Capacity W 6 1 CR LF (When LOCK(soft/hard) cannot write in) Min. Scale Division 2 W 6 0 0 CR LF (When LOCK(soft/hard) cannot write in) Net Over W 6 3 CR LF (When LOCK(soft) cannot write in) **Gross Over** CR LF W 6 4 (When LOCK(soft) cannot write in) **Decimal Place** 5 W 6 0 0 0 0 CR LF (When LOCK(soft/hard) cannot write in) **Unit Display** W 6 6 0 0 0 0 CR LF (When LOCK(soft) cannot write in) 1/4 Scale Div. Display W 6 7 0 0 0 0 CR LF

CR LF

CR LF

(When LOCK(soft) cannot write in)

(When LOCK(soft) cannot write in)

(When LOCK(soft/hard) cannot write in)

Grav. Acceleration

Loadcell Excitation

W 6 8 0 0 0

> 6 9 0 0 0 0

	Communication No.
Graphic Mode	W 7 0 0 0 0 CR LF (When LOCK(soft) cannot write in)
Trigger Level	W 7 1 CR LF (When LOCK(soft) cannot write in)
X End Point	W 7 2 0 0 CR LF (When LOCK(soft) cannot write in)
Y Start Point	W 7 3 CR LF (When LOCK(soft) cannot write in)
Y End Point	W 7 4 CR LF (When LOCK(soft) cannot write in)
Avg. Weight (G/N Data)	W 8 0 CR LF (Read out only)
Max. Weight (G/N Data)	W 8 1 CR LF (Read out only)
Min. Weight (G/N Data)	W 8 2 CR LF (Read out only)
Gen. Stan. Dev.(G/N Data)	W 8 3 CR LF (Read out only)
Smp. Stan. Dev. (G/N Data)	W 8 4 CR LF (Read out only)
Max.—Min. (G/N Data)	W 8 5 CR LF (Read out only)
Avg. Weight (Total Data)	W 8 6 CR LF (Read out only 6 digit)
Max. Weight (Total Data)	W 8 7 CR LF (Read out only 6 digit)
Min. Weight (Total Data)	W 8 8 CR LF (Read out only 6 digit)
Gen. Stan. Dev. (Total Data)	W 8 9 CR LF (Read out only 6 digit)
Smp. Stan. Dev. (Total Data)	W 8 A CR LF (Read out only 6 digit)
MaxMin. (Total Data)	W 8 B CR LF (Read out only 6 digit)
	* When setting W80~W8B, designate the code to be read out in advance.
LOCK(soft)	W 9 0 0 0 0 CR LF
LANGUAGE	W 9 1 0 0 0 CR LF (When LOCK(soft) cannot write in)
Back Light Auto.Light.	W 9 3 0 0 0 0 CR LF (When LOCK(soft) cannot write in)
Back Light Low Time	W 9 4 0 0 0 CR LF (When LOCK(soft) cannot write in)

0

Back Light ON Time

CR LF (When LOCK(soft) cannot write in)

Communication No. Accumulation Command • One Touch Tare Sub. • Range of Tare Sub. Tare Display • Extended Preset Tare Sub. W A 0 1 2 3 4 ⑤ CR LF (When LOCK(soft) cannot write in) *4 Auto Final Tuning · SP0 Mode · I/O Monitor Display (When LOCK(soft) cannot write in)*5 W A 1 0 0 1 2 ③ CR LF SI/F II ID CR LF (When LOCK(soft) cannot write in) 0 0 0 0 D/A Output Mode 0 \mathbf{W} В 0 0 0 0 CR LF (When LOCK(soft) cannot write in) D/A Zero Output W В CR LF (When LOCK(soft) cannot write in) D/A Full Scale 2 CR LF W В (When LOCK(soft) cannot write in) D/A Output ch W В 7 0 0 0 0 CR LF (When LOCK(soft) cannot write in) Data Update Rate 0 0 0 CR LF В 6 0 (When LOCK(soft) cannot write in)

*1 Digital Filter2 - MD Mode

W	3	3	0	0	0	1	2	CR	LF	(When LOCK(soft) cannot write in)
---	---	---	---	---	---	---	---	----	----	-----------------------------------

- ①Digital Filter 2
- 2 Motion Detection Mode

*2 Sequence Mode • At Start NZ Confirmation • At Start WV Confirmation • Auto Jog · Discharge Gate Control



- ②At Start NZ Confirmation
- 3 At Start WV Confirmation
- **4** Auto Jog
- ⑤Discharge Gate Control

*3 Preset Tare Weight • Gross/Net Selection • Discharging Control Sign • TARE/DZ Key - GROSS/NET Key



- ②Gross/Net Selection
- ③Discharging Control Sign
- **4**TARE/DZ Key
- **⑤GROSS/NET Key**

*4 Accumulation Command • One Touch Tare Sub. • Range of Tare Sub. • Tare Display • Extended Preset Tare Sub.



- ②One Touch Tare Sub.
- ③Range of Tare Sub.
- **4** Tare Display
- ⑤Extended Preset Tare Sub.

*5 Auto Final Tuning • SP0 Mode • I/O Monitor Display



- ②SP0 Mode
- ③I/O Monitor Display

Comparison setting

• U/L Limit Comparison

0 : Gross Weight 1 : Net Weight 2 : Total 3: Comparison OFF

• U/L Limit Comparison Mode

0 : COMP. Regularly 1 : EXT. Judging ON

· Near Zero Comparison

0 : Gross Weight 1 : Net Weight 2 : Comparison OFF

3 : Absolute Gross 4 : Absolute Net

· Over/ Under Comparison

0 : Gross/Net 1 : Total 2 : Comparison OFF

· Over/ Under Comparison Mode

0 : COMP. Regularly 1 : EXT. Judging ON 2 : COMP. Signal ON

3: COMP. ON Hold

• COMP. Signal Output

0 : Compare Time 1 : Comp. & Stable 2 : Comp./ Stable

· Weighing Mode

0 : Feeding 1 : Discharging 2 : External

• FF CPS. Coefficient

0:1 1:3/4 2:2/4 3:1/4

· FF CPS.

0 : OFF 1 : ON

Operation setting

Display Frequency

0: 3 Times/ Sec. 1: 6 Times/ Sec. 2:13 Times/ Sec.

3:25 Times/ Sec.

• Digital Filter 1

0 : OFF 1 : 2 Times 2 : 4 Times 3 : 8 Times 4 : 16 Times 5 : 32 Times 6 : 64 Times 7 : 128 Times

· Analog Filter

0:2 Hz 1:4 Hz 2:6 Hz 3:8 Hz

• Digital Filter 2

0: ON 1: OFF

· MD Mode

0 : Stable Mode 1 : Checker Mode

Sequence mode

· Sequence Mode

0 : SIMP. COMP. Mode 1 : Sequence Mode

· At Start NZ CONF.

0 : OFF 1 : ON

· At Start WV Confirmation

0: OFF 1: ON

• Auto Jog

0 : OFF 1 : ON

Discharge Gate Control

0: OFF 1 : ON

• Start/ Stop Key

0 : Invalid 1 : Valid

Function

· Preset Tare Weight

0: OFF 1: ON

· Auto ACCUM. Command

0 : OFF 1 : ON

• Weighing Code SEL.

0 : Key Specify 1 : External Input 2 : Selection

· Setting Code SEL.

0 : Key Input 1 : External Input 2 : Selection

· Gross/ Net SEL.

0 : INT. Key Mode 1 : EXT. Input Mode

· DISCHG. CNTL. Sign

0 : - Sign ON 1 : - Sign OFF

• Tare/ DZ Key

0 : Invalid 1 : Valid

• Gross/ Net Key

0 : Invalid 1 : Valid

· Each Code Key

0 : Invalid 1 : Valid

Calibration

· Decimal Place

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

· Unit Display

0: kg 1: g 2: N 3: t 4: lb 5: none

• 1/4 Scale DIV. DIS.

0 : OFF 1 : ON

· Load cell EXC.

0:5V 1:10V

Graph setting

· Graphic Mode

0 : Single 1 : Continuity 2 : Level (\uparrow) +Exterior

3: Level $(\buildrel \buildrel \bui$

System

• Lock(soft)

0 : OFF 1 : ON

• Language

0 : Japanese 1 : English

· Back Light Auto.Light.

0: Inhibit 1: Effect

Extended Function

· Accumulation Command

0 : Regularly 1 : In Stable Mode

• One Touch Tare Sub.

0 : Regularly 1 : In Stable Mode

· Range of Tare Sub.

0: Whole Range $1: 0 < Tare \le CAPA$.

· Tare Display

0 : Inhibit 1 : Tare Key ON

• Extended Preset Tare Sub.

0 : Inhibit 1 : Effect

· Auto Final Tuning

0 : Inhibit 1 : Effect

• SP0 Mode

0 : Inhibit 1 : Effect

• I/O Monitor Display

0: Inhibit 1: Effect

Option

• D/A Output Mode

0: 4mA Output 1: 20mA Output 2: Interlock(G)

3 : Interlock(N) 4 : Interlock(T)

· D/A Output ch

0 : ch1 1 : ch2

• D/A Renewal Rate

0: 200 Times/Sec. 1: 100 Times/Sec. 2: 50 Times/Sec. 3: 20 Times/Sec. 4: 10 Times/Sec. 5: 5 Times/Sec. 6: 2 Times/Sec. 7: 1 Times/Sec.

14-3-7. RS-232 command

Zero calibration	C A CR	Digital zero reset	С	Н	CR
Span calibration	C B CR	Accumulation command	С	Ι	CR
Gross selection	C C CR	Accumulation clear	С	J	CR
Net selection	C D CR	Accumulation data all clear	С	K	CR
Tare subtraction	C E CR	Back light ON	С	L	CR
Tare reset	C F CR	Sequence Mode Start	С	N	CR
Digital zero	C G CR	Sequence Mode Stop	С	О	CR

14-4. BCD Parallel Data Output Interface [(BCO) Option]

The BCD Data Output Interface is for transferring weighing values in BCD (Binary Coded Decimal) form to PC's PLC's or Sequences for controlling, processing and recording data. The internal and External circuits are opto-isolated.

14-4-1. Connector pin assignment

Adaptable plug: DDK 57-30360 or equivalent one

1	*	COM	19	*	COM	
2	out	1	20	out	20000	
3	out	2	21	out	40000	
4	out	4	22	out	80000	
5	out	8	23	out	minus	
6	out	10	24	out	over	
7	out	20	25	out	p.c	
8	out	40	26	out	strobe	
9	out	80	27	in	data hold	
10	out	100	28	in	logic switch	
11	out	200	29	in	output selection1	
12	out	400	30	in	output selection2	
13	out	800	31	in	output selection3	
14	out	1000	32	in		
15	out	2000	33	in		
16	out	4000	34	in		
17	out	8000	35			
18	out	10000	36			

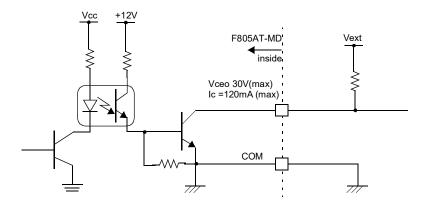
^{*} The connection terminals (COM; Pin 1 and 19) are connected inside.

^{*} The common torminals are connected to the common (COM) of input/Output signal inside.

^{*} No power voltage output.

14-4-2. Equivalent output circuit

The signal output circuit is open-collector output.



status of internal transistor

_		•	
	output	nın	level
•	output	PIII	10 101

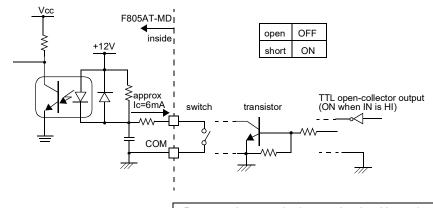
output data	negative	positive						
0	OFF	ON						
1	ON	OFF						

output data	negative	positive		
0	Ι	L		
1	L	Н		

—— Pin 28 : logic change

14-4-3. Equivalent input circuit

Signals are inputted by short-circuiting or opening between the input terminals and the COM terminal. Contacts(a relay, a switch) or contactless switches(a transistor, a TTL of open-collector output) are used for short-circuitting.



- Do not apply external voltage to the signal input circuit.
- Use external elements which withstand Ic=10mA.
- · Leakage of external elements must be less than 100µA.

14-4-4. BCD data output

The weighing values are outputted in 5-digit equivalent 4-bit BCD data.

digit data	8	4	2	1
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1

14-4-5. Polarity output(minus)

The output polarity of weighing values by BCD are "0" for plus and "1" for minus.

14-4-6. Over status output(over)

The output of weighing values by BCD is 1 (over) under the conditions below.

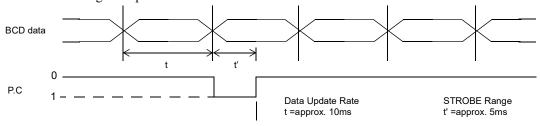
Weighting Value	Conditional Formula	Display
Net weight	When Net weight > Net Over Setting value	OFL1
Gross Weight	When Gross weight > Gross Over Setting value	OFL3
Tare	When Tare > 99999	no display
Gross weight	When DZ > DZ Reguration Value	ZALM blinks

14-4-7. Print command (P.C)

Auto accumulation will occur after weighing when Auto Accumulation Command is ON in Function Mode or by shortiong control I/O pin 8 to COM on the Contorol Connector.

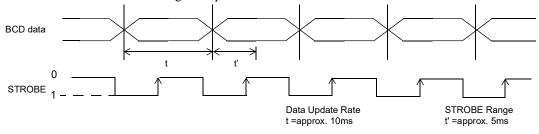
The BCD output gives a pulse signal while accumulating.

Use the end edge of a pulse to read data.



14-4-8. Data strobe(strobe)

The BCD data is renewed by each A/D conversion and a strobe pulse is output synchronously with the BCD data. Use the end edge of a pulse to reach data.



14-4-9. Data hold input

The BCD data is held when this input terminal shorted to COM.

(No strobe pulse output during Hold.)

14-4-10. Logic switch input

Change the output logic. Open: negative. Short: positive.

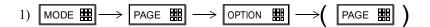
14-4-11. Output selection input

Select the output weighing value by BCD code.

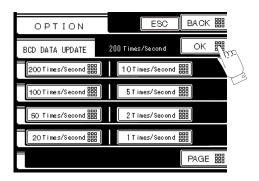
	Selection1	Selection2	Selection3
Follow F805AT-MD display	open	open	open
Tare	short	open	open
Net Weight	open	short	open
Gross Weight	short	short	open
Total Weight	open	open	short

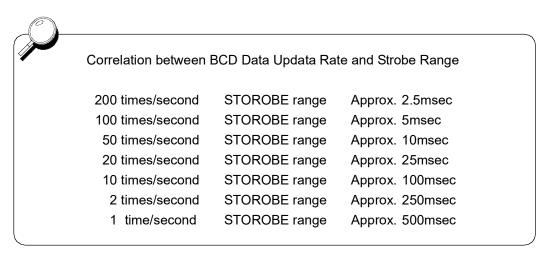
14-4-12. Setting BCD OUTPUT

Operation



2) Select a update rate you want to set by pressing BCD DATA UPDATE RATE , then press OK button.





14-5. BCD Parallel Data Input Interface [(BCI) Option]

The BCD Data Input Interface is for transferring weighing values in BCD(Binary Coded Decimal) form from PC's, Dip switches or Sequences with a BCD output. The internal and external cir-cuits are opto-isolated.

14-5-1. Connector pin assignment(BCD INPUT)

Adaptable plug: DDK 57-30360 or equivalent one

1	*	COM	19	*	COM
2	in	1	20	in	20000
3	in	2	21	in	40000
4	in	4	22	in	80000
5	in	8	23	in	DATA CODE 1
6	in	10	24	in	DATA CODE 2
7	in	20	25	in	DATA CODE 4
8	in	40	26	in	STROBE
9	in	80	27	out	ACK(Acknowledged)
10	in	100	28	out	NAK(Error)
11	in	200	29	out	
12	in	400	30	out	
13	in	800	31	out	
14	in	1000	32	out	
15	in	2000	33	out	
16	in	4000	34	out	
17	in	8000	35		
18	in	10000	36		

^{*} The common terminals (COM; Pin 1 to 19) are connected inside.

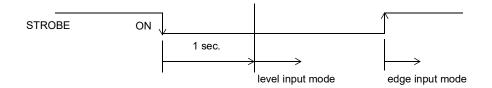
st The common terminals are connected to the COM of external I/O signal inside.

^{*} No power voltage output

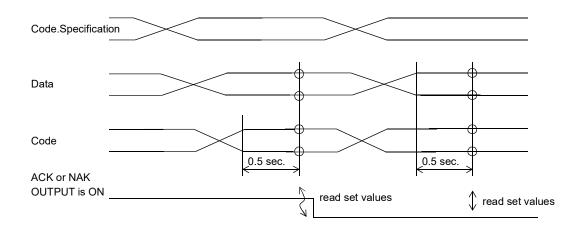
14-5-2. Equivalent circuit

Refer to "Equivalent Output Circuit" and "Equivalent Input Circuit" (Page 146).

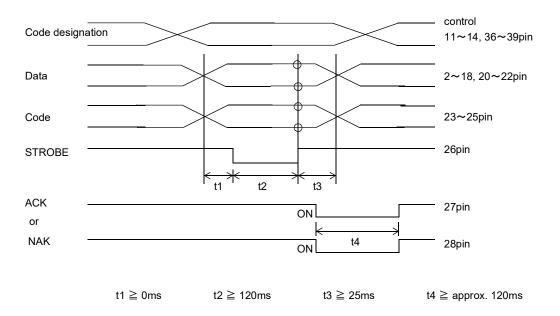
14-5-3. Reading setting values



14-5-4. Level input mode (strobe input, short-circuited)



14-5-5. Edge input mode



- Data and Code input by short-circuit: short=1; open=0
- •When strobe inputs change from short to open(edge of $1 \rightarrow 0$), data or code input status is entered.
- When data is entered normally, ACK has a pluse output.
- When data is not equal to hexadecimal code [A \sim F],NAK has a pulse output. (Setting values do not change.)

14-5-6. Data code 1,2 and 4 (23, 24, 25pin)

4	2	1	Setting Value	
open	open	open	Final	*
open	open	short	FF CPS.	*
open	short	open	Tare	
open	short	short	Upper Limit	
short	open	open	Lower Limit	
short	open	short	Total Final(Upper 5 digit)	*
short	short	open	Total SP1(Upper 5 digit)	*
short	short	short	SP0	*

^{*} Change the Setting values to select Code through the exterrnal input.

14-6. D/A Converter [(DAC) option]

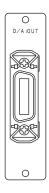
The D/A Converter Interface sends an analog signal for each weighing value (constant-current output $4 \sim 20$ mA). Current over range limit is $\pm 10\%$ range of full scale.

Analog output 0 (4mA) to full scale (20mA) are available for any digital value setting in function of D/A zero setting and D/A full scale.

The body-circuit is isolated from the output circuit.

The resolution is 16 bits and the conversion rate is 200 times/sec.

14-6-1. External output port



Pin assignment

Adaptable plug: DDK-57-30140 or equivalent one

1	+ (ch1)	8	+ (ch2)
2	- (ch1)	9	- (ch2)
3		10	
4		11	
5		12	
6		13	
7		14	

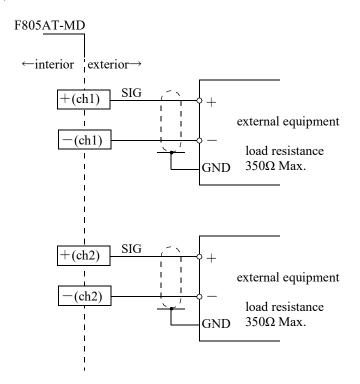


As 3 ~7 pins and 10 ~14 pins are unnecessary for this use, they should not be connected.

Do not apply any voltage from outside or do not shorten the circuit by mistake. It may cause some problem on F805AT-MD itself or external equipment.

Taking out Current output signal

Connect an external equipment (load resistance 350 ohm max.) between + (ch1) \sim - (ch1) or + (ch2) \sim - (ch2) of F805AT-MD.

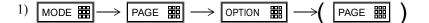




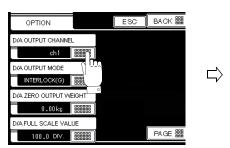
- D/A converter is an option.
- Do not apply any external voltage or current because it causes some damage to D/A converter.
- If capacity load is connected to the converter it may cause oscillation.

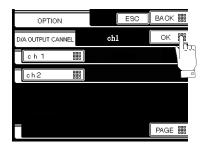
14-6-2. Setting D/A converter

Operation

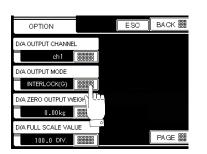


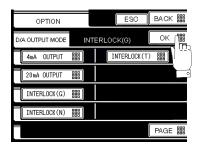
2) Press D/A OUTPUT CHANNEL \longrightarrow Select channel \longrightarrow Press OK for the decision.



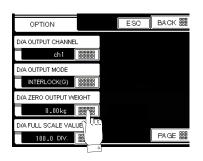


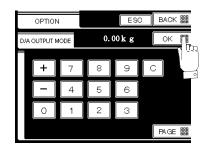
3) Press D/A OUTPUT MODE \longrightarrow Select Output Mode \rightarrow Press OK



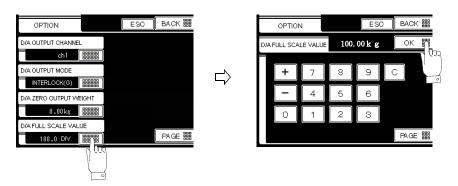


4) Press D/A ZERO OUTPUT WEIGHT \longrightarrow Enter Numbers by Ten-key \longrightarrow Press OK





5) Press D/A FULL SCALE VALUE → Enter Numbers by Ten-key → Press OK

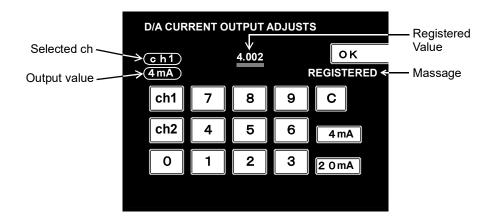


[Fine Adjustment of D/A Converter]

Fine adjustment of D/A converter output can be performed by digital registration. When you adjust the output, connect an ammeter to external equipment (refer to Page 154).

Entering the Pass word in Registration Display

- D/A Zero - Gain Adjustment



(1) Zero (4mA) adjustment

- Select channel from ch1 or ch2
- When 4 mA is pressed, approx. 4mA of current will be outputted.
- Register the indicated value of the ammeter by pressing OK after entering it.
- Error of (registered value -4.000) [mA] is adjusted automatically. When the adjustment is completed "REGISTERED" is displayed.

(2) Gain (20mA) adjustment

- Select channel from ch1 or ch2.
- When 20mA is pressed approx. 20mA of current will be outputted.
- Register the indicated value of the ammeter by pressing OK after entering it.
- Error of (registered value 20.000) [mA] is adjusted automatically. When the adjustment is completed "REGISTERED" is displayed.
- * The output of Zero (4mA) may deviate from the standard after the Gain (20mA) adjustment completed. Check the output value by pressing 4mA.

 If the output deviated from the standard, do (1) procedure again.

 Also check (2) then repeat (1) and (2) until the value is restored.
- * Display return to the main scream by AC power OFF → ON after registration completed.

Notice

If the registration procedure was done mistakenly, the initial condition when it had been dispatched can not be restored.

When any equipment (ammeter etc.) is not available to confirm the current output values (4 \sim 20mA), do not execute fine adjustment of D/A converter.

14-7. RS-485 Interface [(485) option]

14-7-1. Specifications

♦ Standards

Signal level Based on the RS-485C
Transmitting distance approx. 1 km (1.094 yards)
Transmitting method Asynchronous, fullduplex

Transmitting speed 1200, 2400, 4800, 9600, 19200 or 38400bps selectable

Bit configuration Start 1 bit

Character length 7 or 8 selectable

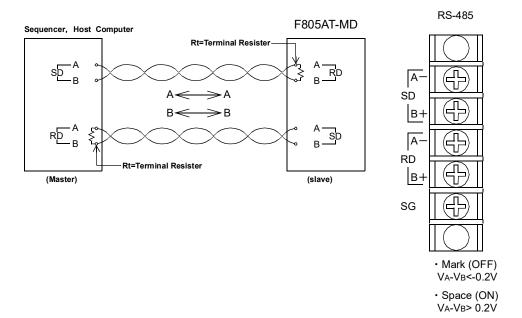
Stop 1 or 2 bits selectable

Parity none, odd, or even selectable

Terminator CR+LF or CR selectable

Code ASCII

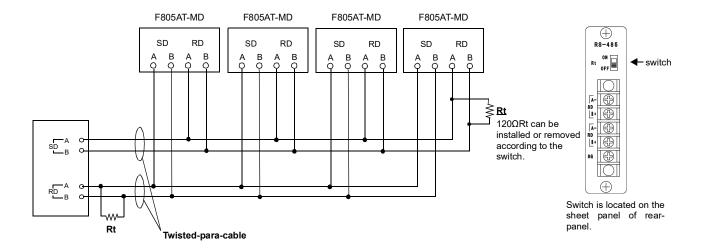
14-7-2. One to One connection



- Use a twisted pair cable for the connection. (Noise margin would be expanded.)

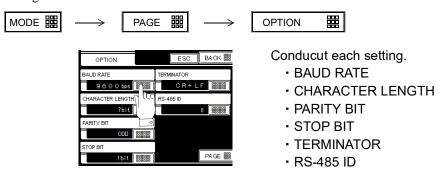
 A twin wire cable is sufficient for the short distance connection.
- Install a terminal resister of 120 ohm level to the receiving side.
- The terminal SG is a grand terminal used on the circuit for protecting the circuit.
 When the main body of F805AT-MD and the device connected to F805AT-MD are grounded by D type ground, there is usually no need to use the terminal SG.
 However, confirm the specifications of the devise connected before connecting the terminal SG, when it is necessary to connect it according to the situation of the site.

14-7-3. One to Multiple connection



14-7-4. Setting value on RS-485

Conduct initial setting of RS-485 port for PC and Sequencer to be connected in accordance with the setting of F805AT-MD.

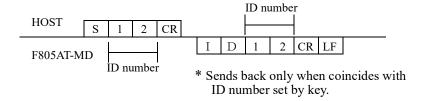


14-7-5. How to communicate

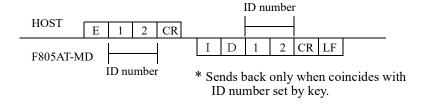
- 1. Set the ID number for each F805AT-MD (ID \neq 0).
- Send Start command including ID number. One F805AT-MD specified by master is now open to communicate. Reading out Weighing data, Setting data, Alternation, and Command become available.
- Before getting communication with other F805AT-MD's possible, send stop command with ID number.

- * Since Tri-state control is performed by Start command and End command, if you only send Start command to multiple F805AT-MD's at the same time, normal communication is interfered due to the collision of output.
- * Do not use "0" as an ID number in a system with multiple F805AT-MD's. because communication is open at start up with ID number "0".
- * When ID number is not 00, other format (R., W., C., etc.) are invalid until Start command below is received after power on.

4. Start command



5. End command



14-7-6. Communication format

Regarding the communication format, see RS-232C communication format since the contents are the same as those of RS-232C.

* When transmitting the communication format, please confirm that the start and end command are transmitting with correct procedure.

15. ERROR & TROUBLE SHOOTING

15-1. Over Scale (Weight Error [Pin 46])

The input of A/D Converter overflowed	LOAD
Net weight > Net Over set value	OFL 1
Gross weight > Capacity + 9 scale division	OFL 2
Gross weight > Gross Over Set value	OFL 3

^{*} Net weight = Gross weight - Tare

15-2. Squence Error (Error [Pin 47])

Error Item	Alarm Message	Alarm Number
When Start signal turns on, the Stop signal turns on, or Total clear signal turns on.	SEQ. ERR. 1	1
During weigh cycle, the Stop signal turns on, or Total clear signal turns on.	SEQ. ERR. 2	2
"Z.ALM"(Zero Alarm) turns on according to set AZ times.	SEQ. ERR. 3	3
During weigh cycle, Near Zero output signal turns off, or when Total and Total count are not cleared at the first Accumulation count ("At start, Near Zero confirmation ON" is selected for Sequence Control).	SEQ. ERR. 4	4
During weigh cycle, the value ≧ Set point 1*, or when Total ≧ Total final — Total SP1 at start ("At start, Weight value confirmation ON" is selected for Sequence Control).	SEQ. ERR. 5	5
During weigh cycle, the Close Discharge Gate signal turns off (stops weighing).	SEQ. ERR. 6	6
During discharge, the Stop signal turns on. (stop discharge).	SEQ. ERR. 7	7
After Discharge output signal turns on, the Open Discharge Gate signal cannot turn on.	SEQ. ERR. 8	8
After Discharge output signal turns off, the Close Discharge Gate signal cannot turn on.	SEQ. ERR. 9	9

^{*} SP1 = Final - Set point1

15-3. Calibration Error

Error Item	Alarm Message	Alarm Number
Re-do Zero Calibration	CAL.ERR.1	1
The initial tare is beyond the zero adjustment range	CAL.ERR.2	2
The initial tare is minus	CAL.ERR.3	3
The input Balance weight is beyonde the Capacity	CAL.ERR.4	4
The Balance weight is 0 0 0 0 0	CAL.ERR.5	5
The loadcell output dose not reach the span adjustment range	CAL.ERR.6	6
The loadcell output is miunus	CAL.ERR.7	7
The loadcell output is beyond the span adjustment range	CAL.ERR.8	8
The weight value is not stable and Calibration stopped	CAL.ERR.9	9

15-4. EXC Error

When the voltage of sensing is too low, "EXC ERR" turns on.

Check the cable between instrument and load cell.

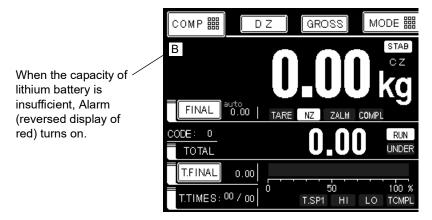
15-5. Priority of Error Display

When prural ERR occured simultaneously, ERR are display following Order

Priority	ERR. Over Scale	
1	CAL.ERR	
2	EXC ERR	
3	- LOAD	
4	LOAD	
5	OFL2	
6	OFL3	
7	OFL1	
8	SEQ. ERR	

16. TROUBLE SHOOTING

Short capacity of lithium battery



When B mark turns on as above, the capacity of lithium battery is insufficient. B mark indicates the ending of battery life.

When you turn F805AT-MD off after leaving it such condition for certain period of time the contents of setting may suddenly be lost.

In this case, the contents stored in NOV RAM are not lost.

When B mark turns on, change the battery earlier.

(The life of lithium battery is approximately 7 years in normal use.)

Over-scale

LOAD(A/D converter over scale)

An input signal from the load cell exceeds F805AT-MD span adjustment 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 F805AT-MD and the load cell;

And whether the load cell connector on the rear panel is open or not, when the load cell connector is open(not connected with the load cell) will display LOAD also.

OFL 1 (Net weight > Net over set value)

Net weight exceeds the Net Over set value.

Decrease the signal coming from the load cell unitl the normal display returns.

Reset the Net Over Value;

If the Net Over value is as the same as or within the value of the Capacity, OFL1 will not be displayed.

OFL 2 (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.



Scale Capacity is a primary data for the F805AT-MD. You must re-calibrate if capacity is changed .

DO NOT CHANGE CAPACITY TO RESET OVER SCALE MESSAGE.

OFL 3 (Gross weight > Gross over set value)

Decrease the signal coming from the load cell until the normal display returns.

Reset the Gross Over value;

If the Gross Over value is as the same as or within the value of the Capacity, OFL3 will not be displayed.

Error display

SEQ. ERR.1(Sequence error)

When Start signal turns on, Stop signal turns on, or Total clear signal is on at start.

Turn OFF Stop signal then start weighing; or enter the Compulsory Discharge Command.

SEQ. ERR.2(Sequence error)

During weigh cycle, Stop signal turns on, or Total clear signal turns on.

Turn OFF Stop signal then start weighing; or enter the Compulsory Discharge Command.

SEQ. ERR.3(Sequence error)

"Z. ALM" (Zero Alarm) turns on according to set times.

Remove excess material causing alarm, set Digital Zero.

Turn OFF Stop signal then start weighing; or enter the Compulsory Discharge Command.

SEQ. ERR.4(Sequence error)

During weigh cycle, Near Zero output signal turns off, or when Total and Total count are not cleared at the first Accumulation count ("At start, Near Zero confirmation ON" is selected for Sequence control).

Confirm the Near Zero set value can compensate for excess material. Confirm the Start signal time period after discharge has finished.

Turn OFF stop signal then start weighing; or enter the Compulsory Discharge Command.

SEQ. ERR.5(Sequence error)

During weigh cycle, the value ≥ Set Point 1, or when Total exceeds Total SP1("At start, Weight value confirmation ON" is selected for Sequence control).

Confirm Set Point 1 and Final value. Confirm the Start signal time period after discharge has finished and verify Code No.

Turn OFF Stop signal then start weighing; or enter the Compulsory Discharge Command.

SEQ. ERR.6(Sequence error)

During weigh cycle, the Close Discharge Gate signal turns off ("Discharge Gate control ON" in Sequence mode).

Turn on the close Discharge Gate signal;

Turn OFF stop signal then Start weighing; or enter the Compulsory Discharge Command.

SEQ. ERR.7(Sequence error)

During discharge, the Stop signal turns on(stops discharge).

Turn OFF Stop signal then start discharging; or enter the Compulsory Discharge Command.

SEQ. ERR.8(Sequence error)

After Discharge output signal turns on, the Open Discharge Gate signal cannot turn on. (Discharging Time plus 2 seconds)

Turn ON the Open Discharge Gate signal; If "Discharging Gate Control (Near Zero confirmation ON)" is selected in Sequence mode remove excess material or change the set value, then turn ON the Open Discharge Gate signal.

SEQ. ERR.9(Sequence error)

After Discharge output signal turns off, the Close Discharge Gate signal cannot turn on. (Discharging Time, plus 2 seconds)

Turn ON the Close Discharge Gate signal or input the signal of compulsory to discharge command.

Refer to page 65 [Simple Comparison Control and Sequence Control] for more information.

Span adjustment range of F805AT-MD is 0.3 ~ 2.0mV/V.

The display up to capacity at span calibration is guaranteed.

If load cell output is under 0.3mV/V (Calibration error 6) or over 2.0mV/V (Calibration error 8) when it reached to the capacity, calibration can not been performed.

Load

Calibration error 6

Calibration error 8

Capacity

Capacity

Capacity

Capacity

Capacity

Capacity

Calibration error 8

CAL. ERR. 1(Calibration error)

Zero Calibration must be entered again.

Zero Calibration should always be done before Span Caibration. If CAL. ERR 1 appears after Span Calibration, Zero Calibration must be entered again.

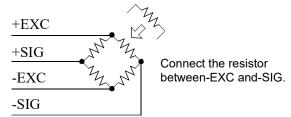
After Zero Calibration CAL. ERR 1 will disappear.

CAL. ERR. 2(Calibration error)

Initial Dead Load is above Zero adjustment range.

Remove any excess load from loadcell or scale. If CAL.ERR.2 is still displayed, connect a resistor between+EXC and -SIG loadcell connections. This should shift the Zero point.

Do Zero Calibration again.



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

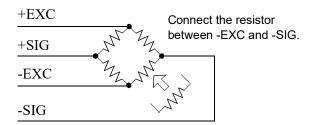
- This table is for a 350 ohm loadcell.
 - When 4 load cells are connected in parallel, the sensitivity decrease to 1/4. Be aware that the resistance also decreases to 1/4 accordingly.
- The temperature coefficient of the connected resistor directly influences the accuracy of the indicator. Use a resistor with a temperature coefficient below 50ppm.

CAL. ERR.3(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 CAL. ERR.3 still displayed, connect a resistor between -EXC and -SIG load cell connections. This should shift the Zero point. Do Zero Calibration again.

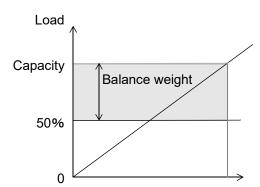


CAL. ERR.4(Calibration error)

The Balance weight is larger than the Capacity.

Re-enter the Balance weight equal to or less than the Capacity. Do Span Calibration again.

The relationship between Capacity and Balance weight



Balance weight must be between 50% to 100% of Capacity in order to do Span Calibration correctly.

CAL. ERR. 5(Calibration error)

The set Balance weight is "00000". set adequate value to Balance weight.

CAL. ERR. 6(Calibration error)

The loadcell output dose not reach the Span range of the F805AT-MD.

Check how load is applied to loadcell; check loadcell has sufficient outpul(mV/V) to reach Span range. Do Span Calibration again.

The span adjustment range of F805AT-MD is between 0.3mV/V and 2.0mV/V. Span Calibration is not Possible if load cell output is not within this range.

CAL. ERR. 7(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.

CAL. ERR. 8(Calibration error)

Load cell output is beyond Span adjustment range.

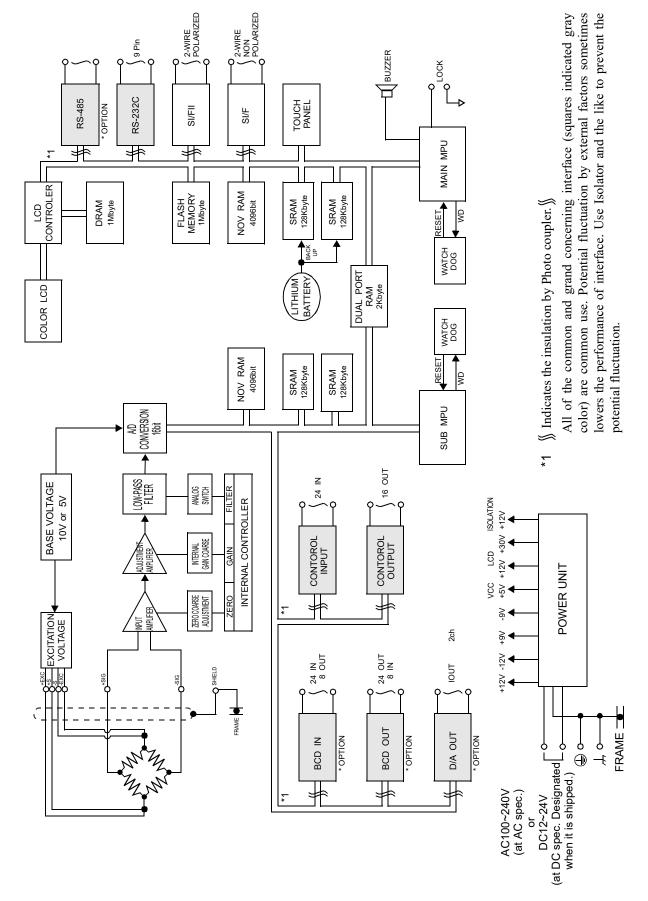
Check how load is applied to load cell; check load cell has sufficient output(mV/V) to reach Span range. Do Span Calibration again.

CAL. ERR. 9(Calibration error)

The Load is not stable enough for correct Calibration.

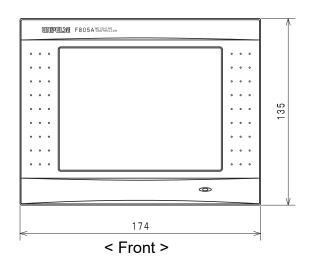
Adjust the Stable Period and Stable Range of Motion Detection so "STAB" display lights during Calibration. Do Calibration again.

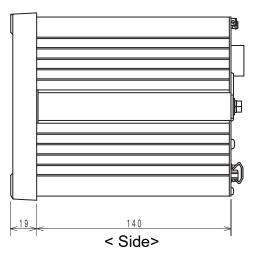
17. BLOCK DIAGRAM

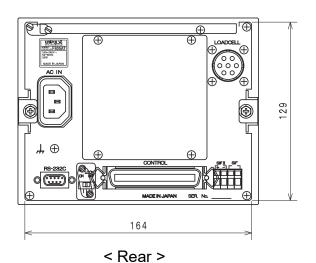


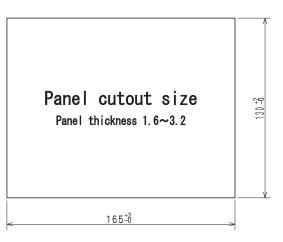
18. DIMENSIONS

Unit: mm







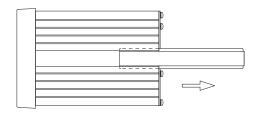


- * Projections excluded
- * Dimensions of F805AT-MD with AC spec. and with DC spec. are the same.

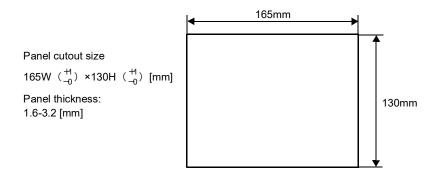
19. MOUNTING ON A PANEL

Please Follow the procedure for F805AT-MD panel mounting.

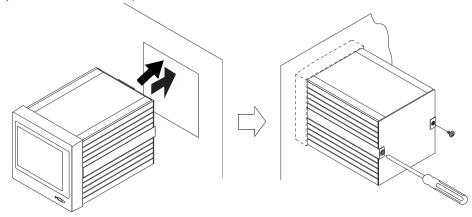
1) Remove the rails of both sides from F805AT-MD.



2) Drill holes following the panel cutout size.



3) Mount F805AT-MD, then fix it with the side rails.



20. SPECIFICATIONS

20-1. Analog

Load cell excitation DC 10V+/-5%

(enables to switchover from 5V to 10V)

Load cell current 120mA (4-350 ohm load cell, when excitation is 10V)

Zero adjustment range 0 to approx. 2mV/V Span adjustment range 0.3 to 2.0mV/V

Analog input signal sensitivity 0.3 micron V/count (Legal for Trade)

0.075 micron V/count expanded

Non-linearity Within 0.01%FS

Analog filter Bessel type low-pass filter (-12dB/oct) 2, 4, 6, 8 Hz

Conversion rate 200 times/ second (5ms)

Display resolution 1/10000 (Legal for Trade)

1/40000 expanded

Secondary calibration Digital calibration (Registration of Reference value)

20-2. Display

Display TFT color LCD

Display area : 116.8W×88.0H [mm]

Dot structure : 320×240 [dot]

Dot Pitch : $0.12W \times 0.36H$ [mm]

Weight value display 5 digits

Sign: Weight display

Only minus sign is displayed on MSD 6 digits: Total display(without sign)

Display update rate Selectable 3, 6, 13, 25 times/sec.z

(internal 200 times/sec.)

Unit Selectable g, kg, t, lb, N, none

Scale capacity 5 digit (up to 99999) Min. scale division $1 \sim 100$ selectable

Decimal point Selectable 0, 0.0, 0.00, 0.000

Over scale display The input of A/D converter overflowed LOAD

Net weight >Net over set value

(5digit setting possible) OFL1
Gross weight >Capacity + 9 scale division OFL2

Gross weight > Gross over set value

(5digit setting possible) OFL3

Center zero 'CZ' turns on when the displayed value is at the center

of zero (0 + /-1/4 scale).

Status display Various weighing status are displayed.

Set value display CODE(2digit), Final(5digit), SP1(5digit),

SP2(5digit), FF CPS.(4digit), Near Zero(5digit),

SP0(5digit), Under(3digit), Over(3digit), Upper Limit(5digit), Lower Limit(5digit), Total Final(6digit), Total SP1(6digit)

Total display Count(2 digit), Total(6 digit)

Accumulation display Accumulating times 4 digits.

Accumulating value 9 digits.

20-3. Configuration

Setting method Analog type touch panel operation or set by a host

computer through RS-232C.

Memory Initial set values-NOV RAM (Non volatile RAM).

Other set Values-C-MOS RAM backed up by a lithium

battery.

20-4. Control INPUT / OUTPUT Signal

External input signal Signals are inputted by shorting or opening Input and

(24) COM terminals.

External output signal Output signal circuit is an open-collector output of a

(16) transistor.

20-5. Interface

Standard equipment

2-Wire serial interface (SI/F)

Connect Controller to Printers and Remote displays (up to 3 units).

Transmitting method : Asynchronous

Transmitting speed : 600bps

2-Wire high speed bi-directional serial interface (SI/FII)

Connect Controller to Printer, Remote displays and Converters (up to 20 units or Indicator up to 4 units).

Transmitting distance: Approx. 300m Transmitting speed: 300,000 bps

RS-232C Communication interface

Weight data, status and set values can be written or read by a host computer.

Signal level : Based on RS-232C

Transmitting distance : Approx. 15m (16.41 yards)

Transmitting method : Asynchronous

Transmitting speed : 1200, 2400, 4800, 9600, 19200 or 38400 selectable.

Bit configuration : Start 1bit

Character length 7 or 8bits selectable.

Stop 1 or 2bits selectable.

Parity none, odd or even selectable.

Code : ASCII

Option

(UP to 4 slots)

OP1 : BCD parallel data output interface (BCO)

Transmits weight data to a PLC or other BCD devices.

Output signal : Weight data (5 digits), sign, over, strobe,

printing command.

Output logic : Positive/ Negative selectable.

Output circuit : Open-collector (Vceo=30V max., Ic=50mA max.)

Input signal : Logic switching, hold, output data selection.

Input circuit : Operated by a contact or an open-collector

put eneur . Operated by a contact of

circuit (Ic=10mA min.).

OP2: BCD parallel data input interface (BCI)

Receives commands from a BCD device.

Input data : BCD data (5 digits)
Input mode : Level/ Edge selectable.

Input circuit : Operated by a contact or an open-collector

circuit (Ic=10mA min.).

OP3: D/A converter interface (DAC)

Weight data converted to an analog signal.

Current output : $4 \sim 20 \text{mA}$

D/A conversion speed : 200 times/sec.

Resolution : 16bit

Over range : Full scale +/-10%

Current 2.4 ~21.6mA

OP4: RS-485 Serial communication interface (485)

Addressable serial communication for connecting multi units.

Signal level : RS-485

Transmission distance : Approx. 1km (1,094 yards)

20-6. General Specifications

(AC spec.)

a. Voltage input $AC100V \sim 240V \ (+10\% -15\%)$

Free power supply 50/60Hz.

b. Inrush current 15A, 5mSec: AC100V at the status of average load

(Reference value) (room temperature, at cold start)

30A, 5mSec: AC200V at the status of average load

(room temperature, at cold start)

(DC spec.: Designated when it is shipped.)

a. Voltage input DC 12~24V ($\pm 15\%$)

b.Inrush current 10A, 0.5mSec : DC12V at the status of average load

(Reference value) (room temperature, at cold start)

35A, 0.4mSec: DC24V at the status of average load

(room temperature, at cold start)

(The followings are the same for AC spec. and DC spec.)

Power consumption Approx. 20W

Operating temperature -10 to +40D. Celsius (+14 to +104D.Fahrenheit) Storage temperature -20 to +60D. Celsius (-4 to +140D. Fahrenheit)

Humidity <85% RH (non-condensation)

Dimension 174W x 159D x 135H (mm)
(6.85 x 5.51 x 5.31 inch)

Projections excluded.

Panel cutout size $165W ({}^{+1}_{-0}) \times 130H ({}^{+1}_{-0}) (mm) (6.5 \times 5.12 inch)$

Panel thickness $1.6 \sim 3.2 \text{ (mm)}$ Weight Approx. 2.3 kg (5.07 pound)

20-7. Attachment

• Operation manual
• Power cable (2m[6.56ft], AC spec. only)
• Plug for power cable (AC spec. and CE marking only)
• Minus Screw driver
• Load cell connector
• Control signal input/output connector
• Ferrite core (CE marking only)
• BCD output connector (with BCD option)1
• BCD input connector (with BCD option)
• Connector for D/A converter (with D/A converter option) 1



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.

21. LIST OF INITIAL SETTING VALUE SCREEN DISPLAY / CONTENTS

Each code

MODE	ACH CODE
------	----------

Function	Initial Value	Code	NOV. RAM	Lock (sw)	Lock (soft)	Display
Final	0.00	0				
Over	0.00	0				
Under	0.00	0				
Free Fall Compensation	0.00	0				
Set Point 2	0.00	0				
Set Point 1	0.00	0				
Free Fall Compensation Regulation	10.00	0			0	
Auto Jog Timer	1.00	0			0	
Accumulation Clear	0.00	0				Command
Total Final	0.00	0				
Total Set Point 1	0.00	0				
Set Point 0	0.00	0				

Screen Display	Contents
FF CPS.	Free Fall Compensation
SP2	Set Point 2
SP1	Set Point 1
FF CPS. REGU	Free Fall Compensation Regulation
AUTO JOG TIM	Auto Jog timer
ACCUM.CLEAR	Accumulated Data Clear
SP0	Set Point 0

Comparison

MODE ##	\longrightarrow	COMPARISON	

Function	Initial Value	Code	NOV. RAM	Lock (sw)	Lock (soft)	Display
U/L Limit Comparison	Gross		0		0	
U/L Limit Comp. Mode	COMP. regularly		0		0	
Upper Limit	0.00kg				0	
Lower Limit	0.00kg				0	
Near Zero Comparison	Gross		0		0	
Near Zero	0.00kg				0	
Over/Under Comparison	Total		0		0	
Over/Under Comp. Mode	COMP. regularly		0		0	
Complete Signal Output	Compare Time		0		0	
Complete Output Time	3.0 sec.		0		0	
Compare Time	1.5 sec.		0		0	
Comp. Inhibit Time	0.50 sec.		0		0	
Weighing Mode	Feeding		0		0	
Weighing Comparison	Gross		0		0	
Free Fall Compensation Coefficient	1		0		0	
Free Fall Compensation	ON		0		0	
Avg. Count of Free Fall Compensation	4 times		0		0	

Screen Display	Contents
U/L LIMIT COMPARISON	Upper/Lower Limit Comparison.
GROSS	Compare with Gross weight.
NET	Compare with Net weight.
Total	Compare with Total weight.
COMPARISON OFF	Comparison OFF.
U/L LIMIT COMP. MODE	Upper/Lower Limit Comparison Mode.
COMP. REGULARLY	Compare regularly.
EXT. JUDGING ON	Compare when the external judging input is ON.
NEAR ZERO COMP.	Near Zero Comparison.
GROSS	Gross weight ≦ Near Zero
NET	Net weight ≦ Near Zero
COMPARISON OFF	Comparison OFF.
ABSOLUTE GROSS	$ \operatorname{Gross} \leq \operatorname{Near} \operatorname{Zero}$
ABSOLUTE NET	$ \operatorname{Net} \leq \operatorname{Near} \operatorname{Zero}$

OVER/UNDER COMP.	Final, Over/Under Comparison.		
GROSS/NET	Compare with Gross/Net weight.		
TOTAL	Compare with Total weight.		
COMPARISON OFF	Comparison OFF.		
OVER/UNDER COMP. MODE	Final, Over/Under Comparison Mode.		
COMP. REGULARLY	Compare regularly.		
EXT. JUDGING ON	Compare when the external judging input is ON.		
COMP. SIGNAL ON	Compare when the complete output signal is ON.		
COMP. ON HOLD	Compare when the complete output signal is ON and the weight value is hold.		
COMP. SIGNAL OUTPUT	Complete signal output.		
COMPARE TIME	After compare time is expired, only during complete output time, complete signal output is ON.		
COMP. & STABLE	After compare time is expired and weight value becomes stable, only during complete output time, complete signal output is ON.		
COMP. / STABLE	After final or Over/Under signal turns on and compare time is expired or weight value becomes stable, only during complete output, complete signal output is ON.		
COMP. OUTPUT TIME	The durance of complete rignal output.		
COMPARE TIME	The durance of judging.		
COMP. INHIBIT TIME	Comparison inhibit time.		
WEIGHING MODE	Discharging control mode selection.		
FEEDING	Feeding weighing.		
DISCHARGING	Discharging weighing.		
EXTERNAL	Control I/O is ON discharging. Control I/O is OFF feeding.		
FF CPS. COEFFICIENT	Free fall data update coefficient.		
FF CPS.	Free fall compensation.		
OFF	Without auto free fall compensation.		
ON	Do auto free fall compensation.		
AVG. COUNT OF FF CPS.	Average count of auto free fall compensation select between 1 to 9.		

Operation



Function	Initial Value	Code	NOV. RAM	Lock (sw)	Lock (soft)	Display
Display Freguency	25times/ sec.		0		0	
Digital Filter 1	16 times		0		0	
Analog Filter	6Hz		0		0	
Digital Filter 2	ON		0		0	
Motion Detection Mode	Stable Mode		0		0	
Motion Detection (period)	1.5 sec.		0		0	
Motion Detection (Range)	5 divisions		0		0	
Zero Tracking (period)	0.0 sec.		0		0	
Zero Tracking (Range)	0		0		0	
DZ Regutation Value	2.00kg		0		0	

Screen Display	Contents
DIGITAL FILTER 2	Software package use to quickly eliminate the effects of plant vibration on weighing systems, while yielding a stable weight reading.
ON	Valid
OFF	Invalid
DZ REGULATION VALUE	Digital Zero regulation value.

Sequence Mode

Screen Display	Contents
SEQUENCE MODE	Sequence mode.
SIMP. COMP. MODE	Simple comparison control.
SEQUENCE MODE	Sequence control.
AZ TIMES	The count for doing Auto Digital Zero.
AT START NZ CONF.	At start, Near Zero confirmation (for sequence controlling).
OFF	
ON	
AT START WV CONF.	At start, weight value confirmation.
DISCH. GATE CNTL	Discharge gate control.

MODE III	SEQUENCE MODE III
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Function	Initial Value	Code	NOV. RAM	Lock (sw)	Lock (soft)	Display
Sequence Mode	Simple Comparison		0		0	
Judging Times	1 times		0		0	
AZ Times	1 times		0		0	
At Start NZ Confirmation	OFF		0		0	
At Start Weight value Confirmation	OFF		0		0	
Auto Jog	OFF		0		0	
Discharge Gate Control	OFF		0		0	
Discharging time	2.0 sec		0		0	
START/STOP Key	Invalid		0		0	

Function



Function	Initial Value	Code	NOV. RAM	Lock (sw)	Lock (soft)	Display
Preset Tare Weight	OFF		0		0	
Preset Tare Value	0.00kg				0	
Tare Reset	NO					Command
Auto Accumulation Command	ON		0		0	
Weighing Code Selection	Key Specify		0		0	
Setting Code Selection	Key Input		0		0	
Gross/Net Selection	Internal Key		0		0	
Discharge Control Mode	Sign ON		0		0	
TARE/DZ Key	Valid		0		0	
GROSS/NET Key	Valid		0		0	
Each Code Key	Valid		0		0	

Screen Display	Contents
PRESET TARE WEIGHT	Preset Tare weight.
PRESET TARE VALUE	Preset Tare value. The preset tare weight by user, and could not be cleared by operating Tare reset.
AUTO ACCUM. COM- MAND	Auto accumulation command.
WEIGHING CODE SEL.	Weighing code selection.
KEY SPECIFY	Key specify via touch screen.
EXTERNAL INPUT	Input signal via control I/O.
SELECTION	Decide by the status of pin 33 of control I/O; OFF: Key specify ON: Via control I/O
SETTING CODE SEL.	Setting code selection.
KEY SPECIFY	Key specify via touch screen.
EXTERNAL INPUT	Input signal via control I/O.
SELECTION	Decide by the status of pin 33 of control I/O; OFF: Key specify ON: Via control I/O
GROSS/NET SEL.	Gross/Net selection.
INT. KEY MODE	Internal key mode. (By key via touch screen)
EXT. INPUT MODE	External input mode. (Inputting signal via control I/O)
DISCHG. CNTL MODE	Discharging control sign.
- SIGN ON	Net weight with minus sign.
- SIGN OFF	Net weight without minus sign. (in loss-in-weight application, shows gain-in-weight)

Extended function

MODE ░ → EXTENDED FUNC. ░

Function	Initial Value	Code	NOV. RAM	Lock (sw)	Lock (soft)	Display
Accumulation Command	Regularly		0		0	
One-Touch Tare Subtraction	Regularly		0		0	
Range of Tare Subtraction	Whole Range		0		0	
Tare Diplay	Inhibit		0		0	
Extended Preset Tare Subtraction	Inhibit		0		0	
Auto Final Tuning	Inhibit		0		0	
SP0 Mode	Inhibit		0		0	
I/O Monitor Display	Inhibit		0		0	

Screen Display	Contents
ACCUM. COMMAND	Accumulation command.
REGULARLY	Accept regularly.
IN STABLE MODE	Accept in stable.
ONE - TOUCH TARE SUB.	One - touch Tare subtraction.
REGULARLY	Accept regularly.
IN STABLE MODE	Accept in stable.
RANGE OF TARE SUB.	Range of Tare subtraction.
WHOLE RANGE	Whole range.
0 < TARE ≦ CAPA.	$0 < TARE \le Capacity$
TARE DISPLAY	Tare weight display.
INHIBIT	Invalid
TARE KEY ON	Hold Tare key, while displays tare subtracted weight.
EXT. PRESET TARE	When one-touch Tare subtraction is effective, digital preset Tare weight 1 ON/OFF is not swichable and preset Tare weight 2 is not changeable.
INHIBIT	NO
EFFECT	YES
AUTO FINAL TUNING	More accurate weighing is performed by automatically tuning up the error for Total final.
INHIBIT	NO
EFFECT	YES
SP0 MODE	More speedy weighing is possible by performing 1-stage control (SP0) instead of 3-stage control (SP1, SP2 and SP3).
INHIBIT	NO
EFFECT	YES
I/O Monitor Display	It will enable the pop-up display of the I / O monitor.
INHIBIT	NO
EFFECT	YES

Calibration



Function	Initial Value	Code	NOV. RAM	Lock (sw)	Lock (soft)	Display
Zero Calibration	0.00kg		0	0	0	Command
Span Calibration	100.00kg		0	0	0	Command
Balance Weight Value	100.00kg		0	0	0	
Capacity	100.00kg		0	0	0	
Minimum Scale Division	0.01		0	0	0	
Equivalent Calibration	2.0000 mV/V		0	0	0	Command
Net Over	999.99kg		0		0	
Gross Over	999.99kg		0		0	
Decimal Place	0.00		0	0	0	
Unit Display	kg		0		0	
1/4 Scale Division Display	ON		0		0	
Gravitational Acceleration	9		0		0	
Load cell Excitation	10V		0	0	0	

Graph



Function	Initial Value	Code	NOV. RAM	Lock (sw)	Lock (soft)	Display
Graphic Mode	SINGLE		0		0	
Triger Level	0.00kg		0		0	
X End Point	10.0 sec.		0		0	
Y Start Point	0.00kg		0		0	
Y End Point	150.00kg		0		0	

Data

MODE >	DATA	
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Function	Initial Value	Code	NOV. RAM	Lock (sw)	Lock (soft)	Display
Average Weight (G/N)	0.00	0				0
Maximum Weight (G/N)	0.00	0				0
Minimimu Weight (G/N)	0.00	0				0
General Standard Deviation (G/N)	0.00	0				0
Sample Standard Deviation (G/N)	0.00	0				0
Count of Data (G/N)	0	0				0
Latest Data (G/N)	0.00	0				0
MaxMin. (G/N)	0.00	0				0
Average Weight (Total)	0.00	0				0
Maximum Weight (Total)	0.00	0				0
Minimimu Weight (Total)	0.00	0				0
General Standard Deviation (Total)	0.00	0				0
Sample Standard Deviation (Total)	0.00	0				©
Count of Data (Total)	0	0				0
Latest Data (Total)	0.00	0				0
MaxMin. (Total)	0.00	0				0

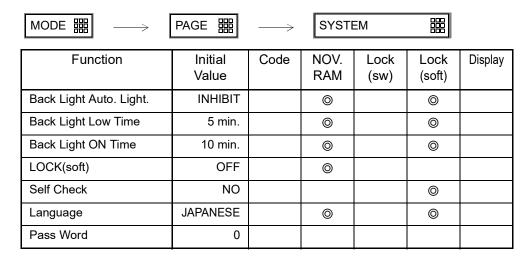
Communication

MODE

☐ COMMUNICATION
☐

Function	Initial Value	Code	NOV. RAM	Lock (sw)	Lock (soft)	Display
Baud Rate	9600bps		0		0	
Character Length	7bit		0		0	
Parity Bit	ODD		0		0	
Stop Bit	1bit		0		0	
Terminator	CR+LF		0		0	
SIFII ID	0		0		0	

System



Option



RS-485

Function	Initial Value	Code	NOV. RAM	Lock (sw)	Lock (soft)	Display
Baoud Rate	9600bps		0		0	
Character Length	7bit		0		0	
Parity Bit	ODD		0		0	
Stop Bit	1bit		0		0	
Terminator	CR+LF		0		0	
RS-485 ID	0		0		0	

D/A Converter

Function	Initial Value	Code	NOV. RAM	Lock (sw)	Lock (soft)	Display
D/A Output Channel	ch1		0		0	
D/AOutput Mode (ch1)	INTER LOCK(G)		0		0	
D/A Zero Output Weight (ch1)	0.00kg		0		0	
D/A Full Scale Value (ch1)	100.00kg		0		0	
D/AOutput Mode (ch2)	INTER LOCK(G)		0		0	
D/A Zero Output Weight (ch2)	0.00kg		0		0	
D/A Full Scale Value (ch2)	100.00kg		0		0	

BCD Output

Function	Initial Value	Code	NOV. RAM	Lock (sw)	Lock (soft)	Display
BCD Data Update Rate	200 times/sec.		0		0	

22. STATEMENT OF CONFORMATION TO EC DIRECTIVES (Designated when it is shipped)

* The following notice must be observed only CE marking.

Unipulse F805AT-MD Multi-draft Controller conforms to The EC Directives (based on Council of the European Communities), and is allowed to affix CE mark on it.

- Low Voltage Directive EN61010-1:2010 (Overvoltage category II) Pollution degree 2

EN62311:2008 (test distance: 0cm)

- EMC Directive EN61326-1:2006

EN55011:2009, A1:2010 Group1, ClassA EN61000-3-2:2006, A1:2009, A2:2009

EN61000-3-3:2008 EN61000-4-2:2009

EN61000-4-3:2006, A1:2008, A2:2010

EN61000-4-4:2004, A1:2010

EN61000-4-5:2006 EN61000-4-6:2009 EN61000-4-8:2010 EN61000-4-11:2004

The following notice must be observed when you install F805AT-MD unit.

- 1. Since F805AT-MD 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.
- 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.
- 4. Attach separate type ferrite core (supplied as standard item with the unit) on terminal box side of power supply cable and also on connecting cable to sensor.

Notice

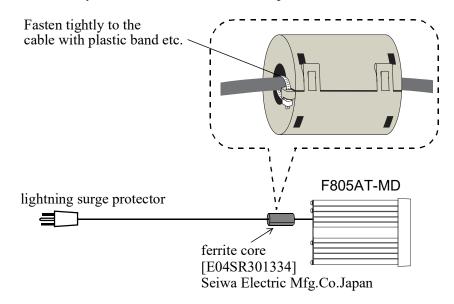
Lightning surge protector is not included in standard supply for F805AT-MD.

The combination of the main unit of the F805AT-MD and a lightning surge protector conforms to EN61000-4-5 (lightning surge immunity) in the EMC Directives.

Please refer to "Connection of Lightning serge protector" on P.190 for information regarding lightning surge protector connection.

Attachment of a ferrite core (power source cable)

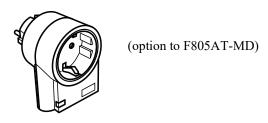
It is necessary to attach the ferrite core to the power source cable.



Connection of Lightning serge protector

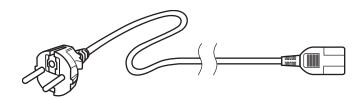
The F805AT-MD main body conforms to EMC directive EN61000-4-5 (lightning surge immunity) in combination with the lightning surge protector.

AC Spec.



No lightning surge protector 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.



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