Minebea intec
The true measure

Operating instructions

Weight Controller CSD-918

Translation of original operating instructions 949905091800 Edition 1.1.0 03/04/2022

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Foreword

Must be followed!

Any information in this document is subject to change without notice and does not represent a commitment on the part of Minebea Intec unless legally prescribed. This product should only be operated/installed by trained and qualified personnel. In correspondence concerning this product, the type, name, and release number/serial number as well as all license numbers relating to the product have to be cited.

Note

Table of contents

1 Introduction

1.1 Read the manual

- Please read this manual carefully and completely before using the product.
- This manual is part of the product. Keep it in a safe and easily accessible location.

1.2 This is what operating instructions look like

1. - n. are placed before steps that must be done in sequence.

▶ is placed before a step.

▷ describes the result of a step.

1.3 This is what lists look like

- indicates an item in a list.

1.4 This is what menu items and softkeys look like

[ ] frame menu items and softkeys.

Example:

[Start]- [Applications]- [Excel]

1.5 This is what the safety instructions look like

Signal words indicate the severity of the danger involved when measures for preventing hazards are not followed.

⚠ DANGER

Warning of personal injury

DANGER indicates death or severe, irreversible personal injury which will occur if the corresponding safety measures are not observed.

▶ Take the corresponding safety precautions.

⚠ WARNING

Warning of hazardous area and/or personal injury

WARNING indicates that death or severe, irreversible injury may occur if appropriate safety measures are not observed.

▶ Take the corresponding safety precautions.

⚠ CAUTION

Warning of personal injury.

CAUTION indicates that minor, reversible injury may occur if appropriate safety measures are not observed.

▶ Take the corresponding safety precautions.

NOTICE

Warning of damage to property and/or the environment.

NOTICE indicates that damage to property and/or the environment may occur if appropriate safety measures are not observed.

▶ Take the corresponding safety precautions.

Note:

User tips, useful information, and notes.

1.6 Hotline

Phone: +49.40.67960.444

Fax: +49.40.67960.474

eMail: help@minebea-intec.com

2 Safety instructions

2.1 General information

Thank you for purchasing the Weight Controller CSD-918.

This Operating instructions describes how to use the device and provides other useful information.

Incorrect handling may cause the device to malfunction.

Read this Operating instructions thoroughly in advance to ensure correct use.

Store this Operating instructions in a location that is readily accessible to end users.

Note:

Describes precautions and provides other information on operation and settings for the CSD-918. Read these indications to avoid malfunction.

2.2 Intended use

The device is intended for use of the analysis device for weighing functions.

Product operation, commissioning and maintenance must be performed by trained and qualified personnel who are aware of and able to deal with the related hazards and take suitable measures for self-protection.

The device reflects the state of the art.

The manufacturer does not accept any liability for damage caused by third-party system components or due to incorrect use of the product. The use of this product signifies recognition of the stipulations listed above.

2.3 For safe operation

2.3.1 Location of installation

NOTICE

Warning of damage to property and/or the environment.

Do not install in the following locations.

▶ To do so may damage the device.

- Places exposed to direct sunlight and/or high temperatures
- Places with high humidity
- Places where the device may be subject to vibrations or mechanical shocks
- Environments contaminated with dust and/or coarse particulates
- Environments containing corrosive gases or salt
- Environments subject to sudden temperature and/or humidity fluctuations
- Near devices that generate magnetic fields or electromagnetic waves
- Environments vulnerable to radioactivity or radioactive rays
- Laboratories or other environments where chemical reactions take place

Set up an operation control panel if the instrument is used in the following locations:

- Places exposed to water and/or spillages
- Places contaminated with dust and/or fine particles

NOTICE

Risk of malfunctions

Use the instrument under the following conditions of temperature and humidity.

- ▶ Environmental temperature: 0°C to 40°C.
- ▶ Environmental humidity: Less than 85 % R. H. or less (Non condensing)

2.3.2 Installing the instrument

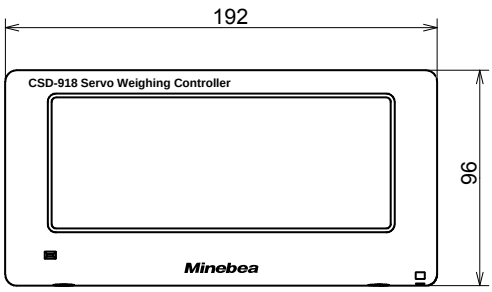
NOTICE

Warning of damage to property and/or the environment.

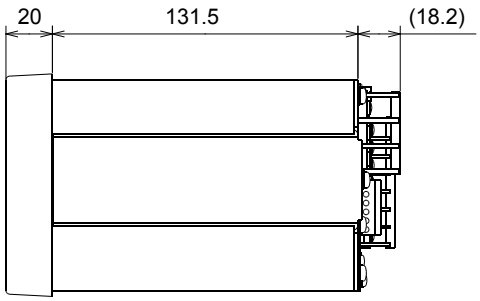
- ▶ Install CSD-918 based on the following dimensions.
- ▶ Ensure sufficient space around the instrument.

The following are the dimensions of CSD-918 and the clearance required.

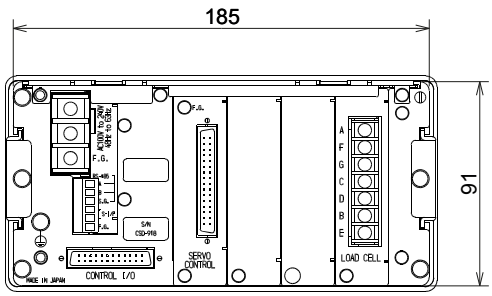
Front



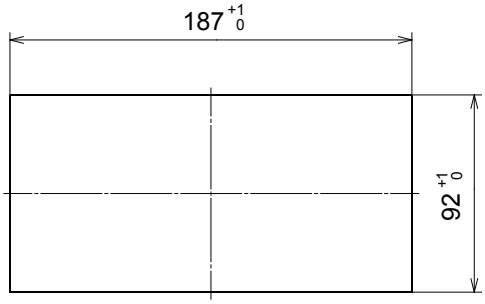
Side



Rear



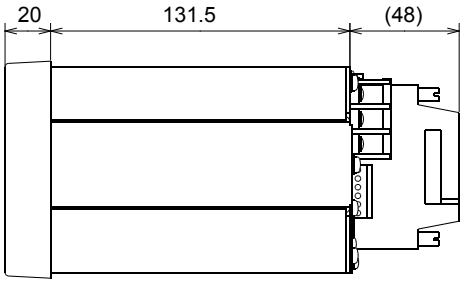
Panel cut size



all dimensions in mm

Side when servo control interface connector is installed.

The attached external I/O connector is the same size as the servo control interface connector.



all dimensions in mm

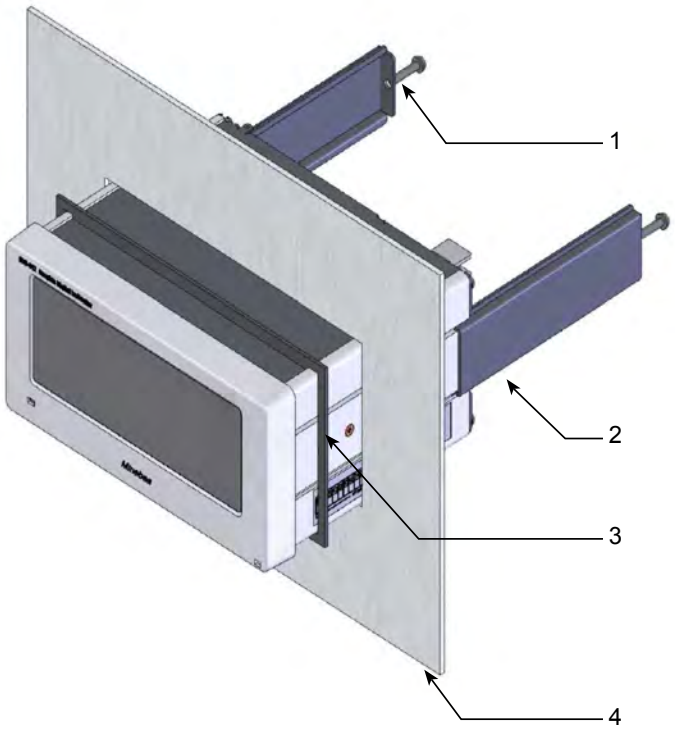
Applicable environment

If the CSD-918 is exposed to water or dust, use the attached panel mount gasket between the control board (cabinet) and the body.

The panel mount gasket ensures the front panel section of CSD-918 is dustproof and waterproof in compliance with IP65 (International Protection Code).

Carefully check the direction of the panel mount gasket so as not to install it upside-down. Install the gasket in a upright position and make sure that it is not twisted.

Please note that there is the upper and lower direction in the panel mount gasket. Also, please mount this unit so that there is neither twist of gasket nor a gap of the mounting position.



1	2× screw (M4×12)
2	Panel mounting metal
3	Panel mount gasket (dustproof/waterproof)
4	Control cabinet

2.3.3 Power supply

⚠ WARNING

Working on the instrument while it is switched on may have life-threatening consequences.

If the power is ON, the operator may get an electric shock or the device may be damaged.

- Check that the power supply is OFF when installing cables.
- Before switching on the power, check that the supplied power is identical to the device voltage/specifications. Please contact a Minebea Intec sales or service office if they do not match.
- Failing to check the above may cause damage to the device or result in electric shock.

⚠ WARNING

Working on an ungrounded instrument may have life-threatening consequences.

If the instrument is not grounded, the instrument may malfunction or the operator may receive an electric shock.

- It is essential to ground the device with grounding wire.

2.3.4 Operating precautions

⚠ CAUTION

Warning of personal injury and damage to property.

Incorrect wiring may falsify weighing results, lead to malfunction of the instrument, damage peripheral equipment or lead to critical accidents.

- Check that all wires are connected properly before use CSD-918.

NOTICE

Warning of damage to property.

Falsify weighing results, malfunction of the instrument or damage to peripheral equipment are possible.

- Calibrate the instrument before first-time use or when replacing the load cells.
- Recalibrate if problems persist after calibration.

NOTICE

Warning of damage to property.

Falsify weighing results, malfunction of the instrument or damage to peripheral equipment are possible.

- Do not change device settings during measurement.

NOTICE

Warning of damage to property.

Impact or shock may damage the instrument or cause electrical circuit failures.

- ▶ Protect the device from impact and shock. Do not strike the device with any other object.

⚠ CAUTION

Warning of personal injury and damage to property.

Negative impact on human health due to incorrect handling of chemicals are possible.

- ▶ Handle chemicals with great care.
- ▶ If the display surface gets dirty, wipe it gently with a soft cloth or a cloth moistened with neutral detergent or a small amount of ethyl alcohol.

⚠ CAUTION

Warning of personal injury.

Damaging the display may cause leakage of liquid crystal.

- ▶ Keep the liquid crystal away from your eyes and mouth.
- ▶ Wash away any liquid that adheres to your body immediately with soap.

⚠ CAUTION

Warning of personal injury and damage to property.

- ▶ Install the instrument based on the specified dimensions and clearance stipulations.

NOTICE

Warning of damage to property.

Damage to the case or the liquid crystal display, or effect durability and operability are possible.

- ▶ Do not disassemble the instrument, except for operations allowed in this manual, such as removing the liquid crystal display.

NOTICE

Warning of damage to property.

Damage to the touch panel and effect durability and operability are possible.

- ▶ Do not handle the display with excessive force.
- ▶ Do not push or scratch the display, such as with a screwdriver.

Note:

Never push the panel sheet of the instrument with strong force more than necessity is required, or push it with s sharp end of the driver or rap it. The touch panel will have damage and have the possibility of resistance to environment or operability.

Note:

There may have the possibility that the occurrence of persistence of vision, avoid to display the fixed pattern for a long time. When using a fixed pattern for a long time, we recommend using with the [backlit OFF].

2.3.5 Conformed standards

CSD-918 complies with the following standards.

EN61326-1: 2013	Electrical equipment for measurement, control and laboratory use - EMC requirements. Immunity test requirements for equipment intended for use in industrial locations.
EN61010-1: 2010	Safety requirements for electrical equipment for measurement, control, and laboratory use. Part1: General requirement.
EN50581: 2012	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances. (RoHS Directive)

⚠ CAUTION

Warning of personal injury and damage to property.

Please observe the following conditions strictly when above mentioned standard complies on this instrument.

- Shield processing: Cables other than power cable must use all shielded cables. Refer to relative notes, about method of shield processing. Please process the shield securely after referring to each paragraph by grounding the shield of shielded wire on this unit and the opposition unit, or by the conduit piping including the storage case.
- Grounding: The ground of this instrument shall apply the individual ground by using the protective ground terminal

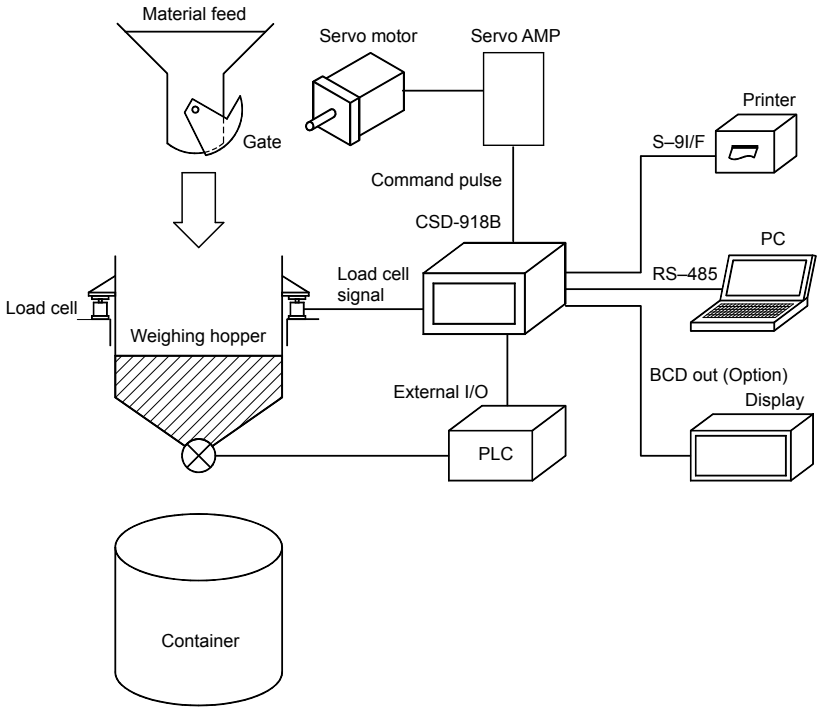
3 Product overview

This chapter gives an overview of CSD-918.

3.1 Features of CSD-918

CSD-918 is a weighing controller with graphical digital display that weights constant feed and discharge amounts by controlling the gate through a combination of a servo amplifier and servo motor.

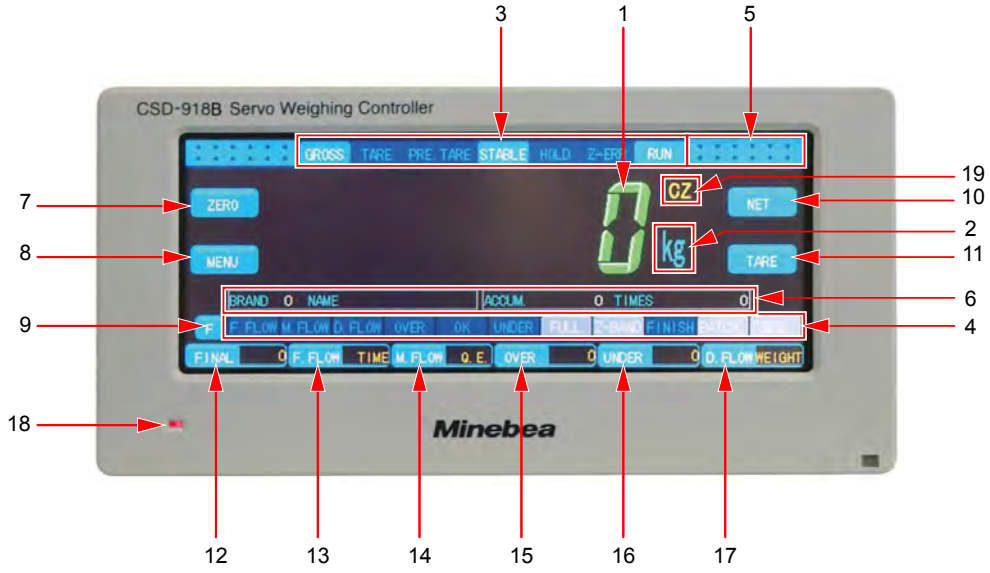
It can be used for such systems as packing machines. Moreover, it can connect to the other equipment, such as PCs and printers, through various interfaces.



CSD-918 provides diagrammatic displays of weight value changes.

3.2 Names and functions of parts

3.2.1 Front panel



1	**Weight display section** Gross / Net and OL (Over) / OVF (over of A/D value) is displayed.
2	**Unit display section** Displays the set weighing units
3	**Status display section 1** GROSS WEIGHT/NET WEIGHT : Displays Gross weight/Net weight according to the weight display TARE WEIGHT : Lights when tare weight cancellation is executed PRESET TARE WEIGHT : Lights when preset tare weight cancellation is executed STABLE : Lights when weighing operation is stable HOLD : Lights when the HOLD function is active Z-ERR : Lights when zero set is executed outwith the zero set range, or when tare weight is executed outwith the tare weight range RUN : Lights in weighing mode

4	**Status display section 2**	
	Displays each output status during sequential weighing	
	F. (Coarse) FLOW	: Lights when coarse flow signal output is ON
	M. (Middle) FLOW	: Lights when middle flow signal output is ON
	D. (Fine) FLOW	: Lights when fine flow signal output is ON
	OVER	: Lights when net weight is the OVER judgement condition set for each brand
	OK	: Lights when net weight is the OK judgement condition set for each brand
	UNDER	: Lights when net weight is the UNDER judgement condition set for each brand
	FULL	: Lights when gross weight or net weight exceeds the FULL range set for each brand
	Z-BAND	: Lights when gross weight or net weight is the ZERO BAND judgement condition set for each brand
	FINISH	: Lights when the FINISH signal is output
	INFLOW/DISCH.	: Switches the display between INFLOW/DISCH. in accordance with the control mode
	SEQ./MEAS.	: Displays the current weighing status; Displays[SEQ.] when weighing operation is not being executed Displays [MEAS.] during weighing operation

5 **Status display section 3**
Displays error status

SQ. ERR 0	:	Lights when weighing is forcibly interrupted by temporary stop input
SQ. ERR 1	:	Lights when the SAFETY CHECK condition is not satisfied
SQ. ERR 2	:	Lights when the load value is insufficient, even if post-batching is executed
SQ. ERR 3	:	Lights when magnitude correlation of the comparison value is contradictory
SQ. ERR 4	:	When the inflow time exceeds the time limit
SQ. ERR 5	:	When the discharge time exceeds the time limit
SQ. ERR 6	:	Lights when gross weight is less than the final value during discharge control
SQ. ERR 7	:	Lights when initial net weight > final value – fine flow
SQ. ERR 8	:	Lights if the nozzle makes contact with the container during nozzle control
SQ. ERR 9	:	Lights if there is no container on the load cell when weighing with [START ABOVE ZERO BAND](start from zero band or above) set to effective
SQ. ERR 10	:	Lights if a weighing signal is input while the gate is manually operated
SQ. ERR 11	:	Lights if the input weighing signal excludes the original gate position
SV. ERR EMG	:	Lights when the [EMG] switch is pressed
SV. ERR ALM	:	Lights when an alarm signal is output from the servo amplifier
SV. ERR RD	:	Lights when a ready signal is not output from the servo amplifier
SV. ERR + LMT	:	Lights if the gate exceeds the OPEN side limit position
SV. ERR - LMT	:	Lights if the gate exceeds the CLOSE side limit position
SV. ERR SLMT	:	Lights if the gate exceeds the software limit position
SV. ERR ORG	:	Lights when the original point cannot be detected by the original point detection

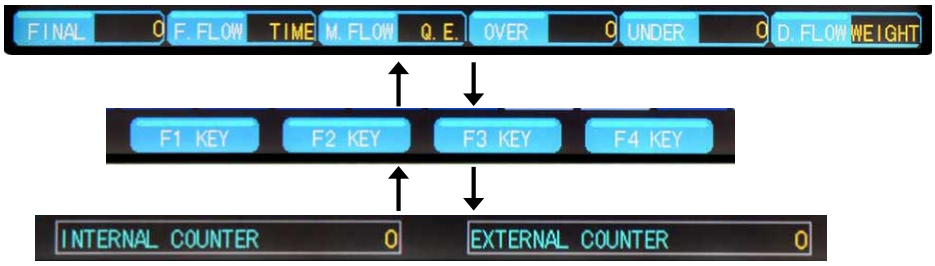
Note:
Select [ERR. RESET] on the left of the screen to release the error and the servo error.

6 Brand information display section
Displays current brand number, brand name, accumulation value and accumulation times

7 **[ZERO]**
Saves the current load display as [zero point] and sets the display value to [0]

8 **[MENU]**
Switches from the weighing screen to the menu screen

9 **[F]** (Function)
Switches the display from [FINAL] to [D. (Fine) FLOW] to [F1] ~ [F4] or [INTERNAL COUNTER] and [EXTERNAL COUNTER]



Refer to Chapter 10 on [F1] to [F4]

Note:
- The [INTERNAL COUNTER]display indicates the command pulse amount (output).
- The [EXTERNAL COUNTER] display indicates the 4 multiplication encoder pulse amount (input).

10 **[GROSS/NET]**
Switches the load display between gross weight and net weight
[NET WEIGHT] is displayed if the current load display is gross weight; [GROSS WEIGHT] is displayed if the current load display is net weight.

11 **[TARE]**
Executes tare weight cancellation

12 **[FINAL]**
Sets final value for the displayed brand

13 **[F.FLOW]**
Sets the coarse flow final value for the displayed brand

14 **[M.FLOW]**
Sets the middle flow final value for the displayed brand

15 **[OVER]**
Sets the OVER value for the displayed brand

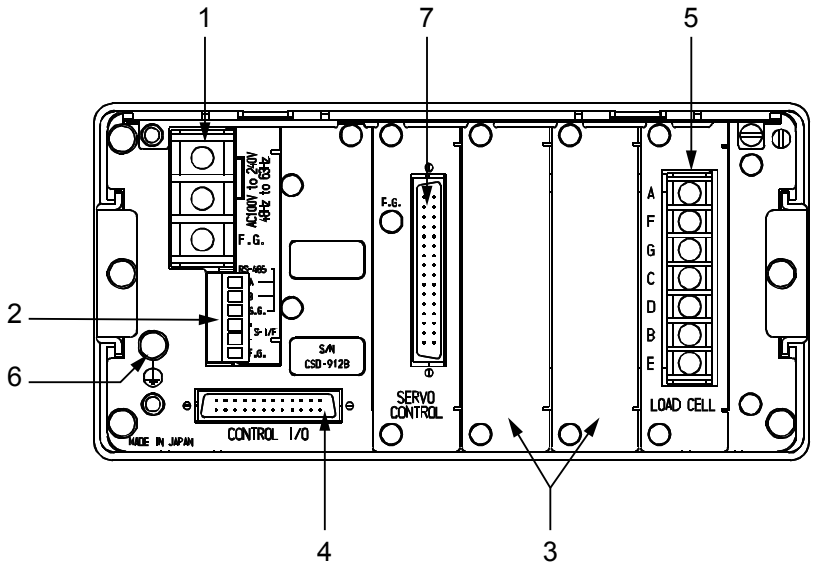
16 **[UNDER]**
Sets the UNDER value for the displayed brand

17 **[D.FLOW]**
Sets the fine flow value for the displayed brand

18 **POWER LED**
Lights when the power is on

19 **CZ display section**
Displays the CZ (Center Zero) load display value
Lights when the displayed load value is [ZERO] and within ±1/4 of the scale interval (minimum scale value)

3.2.2 Rear panel



1	**Power supply terminals** Connections for power supply and ground
2	**Terminals for RS-485 interface and 2-pin method serial interface** RS-485 interface terminals connect with a host computer, etc., and 2-pin method serial interface terminals connect with a printer, an external display unit, etc.
3	**Optional parts mounting section (2 slots)** An analog current output, analog voltage output, BCD output, RS-232C interface or RS-422/485 interface can be mounted to each slot. Up to 2 slots can be used synchronously. One out of serial interface, RS-232C interface and RS-422/485 interface can be installed. The device cannot accommodate duplicate optional parts except for BCD output.
4	**External control I/O connector** Connects to an external control unit The input and the output can be connected to up to 11 points
5	**Load cell terminals** Connects the signal line of the load cell Up to 4 load cells (350 Ω) can be connected when the bridge power supply is 12 V DC.
6	**Protective ground terminal** Be sure to connect a grounding wire to prevent noise, including static electricity. Only connect a grounding wire to this terminal. This terminal is shared internally with the power supply terminal frame ground
7	**Servo control interface connector** Connect the signal cable for servo control (by servo amplifier)

4 Wiring

This chapter describes how to connect load cells and power sources.

4.1 Precautions for wiring

- Connect wires with the device power off.
- Do not connect the power supply until all installation and wire connections are complete. The device has no ON/OFF switch for power supply.
- Do not drop the device or subject it to impacts because the terminal block of the rear panel is made by resin.
- Install and use the attached acrylic cover for the terminal boards.
- The tightening torque for screws on the terminal board are given in the table below.

Terminal board	Tightening torque of screws
Power supply	1.4 Nm
Load cell	0.6 Nm

- Applicable solderless terminals are as follows.

Terminal board	Solderless terminal width	Applicable solderless terminal
Power supply	9.0 mm or less	1.25-4, 2-4 or Y type 1.25-4 and 2-4
Load cell	6.2 mm or less	1.25-3 or Y type 1.25-3.5

- Isolate cables connected to the unit from such noise sources as dynamic power lines and control I/O.
- As dedicated wiring is used for conduit wiring, avoid sharing it with other lines.
- Be sure to connect a grounding wire. Grounding should be D-class single grounding. Avoid sharing it with other power supply groundings.
- Use shielded cable for connection with external control I/O, and connect the shield with the F.G terminal of the power supply terminals.

4.2 Connection with load cells

The CSD-918 needs to be connected to a load cell to facilitate weighing.

Examples of CSD-918 connected with load cells are given below.

Note:

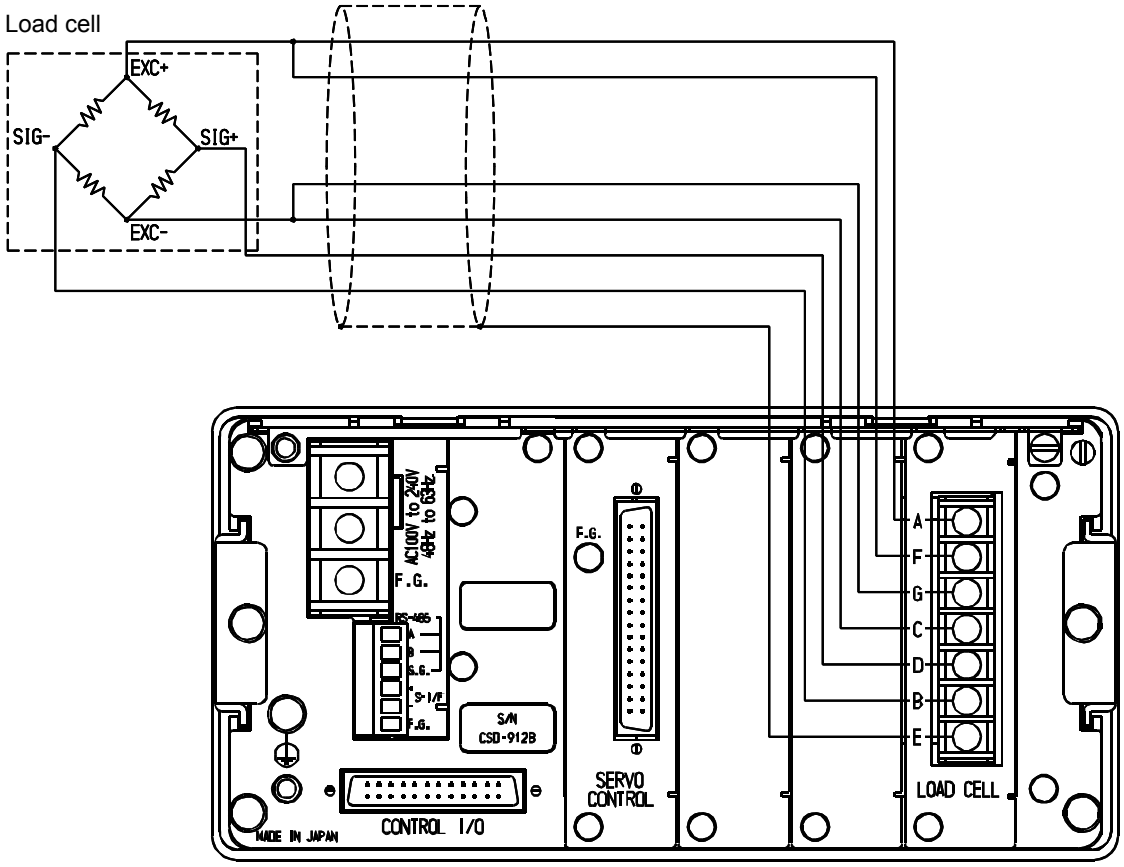
When a tension or tension/compression load cell is used in the direction of the tension and the + direction is displayed, connect the load cell input + to terminal B and the load cell input – to terminal D, respectively.

4.2.1 6-wire connection cable

Connect CSD-918 to a load cell using a 6-wire cable as follows.

Note:

The colors listed here apply for the Minebea Intec load cell and connection cables of type "PR ..."



A	+ EXC	Load cell power supply V+	**red**
F	+ SEN	Sense S+	**white**
G	– SEN	Sense S–	**black**
C	– EXC	Load cell power supply V–	**blue**
D	+ SIG	Load cell signal (meas. voltage) M+	**green**
B	– SIG	Load cell signal (meas. voltage) M–	**gray**
E	SHIELD	Screen	**yellow**

Note:

- Be sure to bridge Sense+ and Sense- close to the load cell.

  If bridged Sense+ and Sense- close to the device, the sense function will not work.

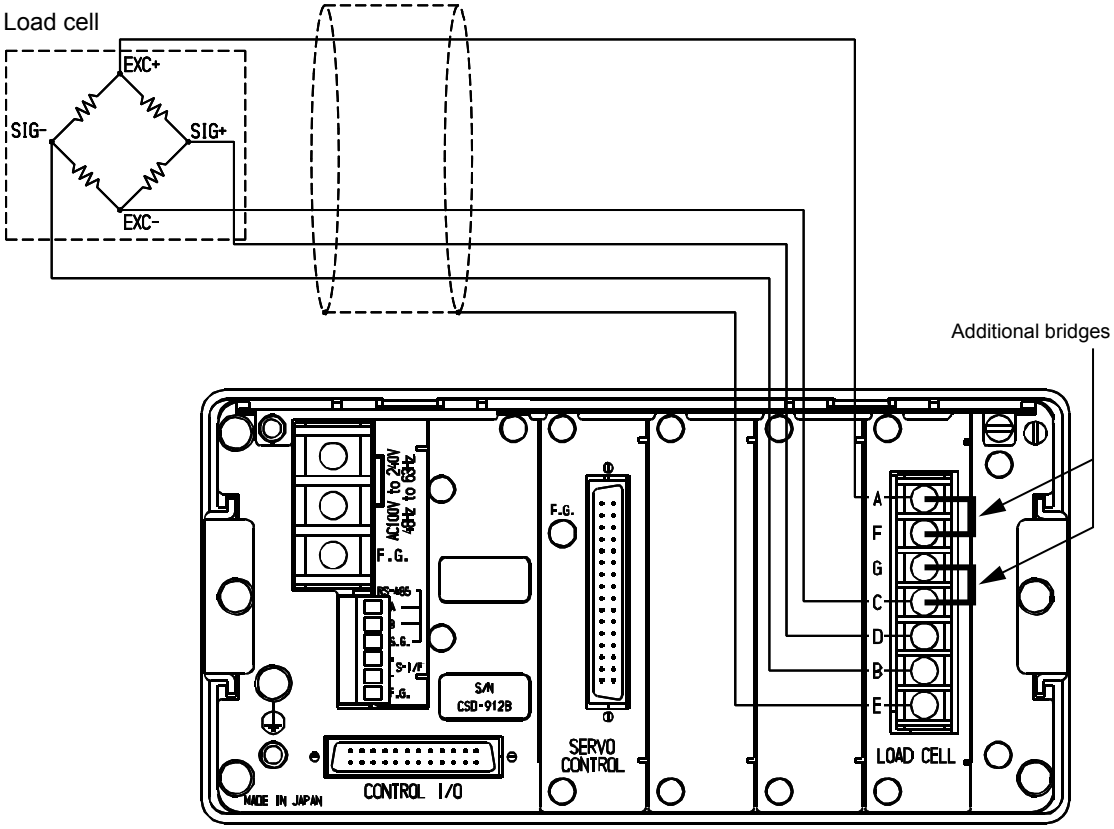
  If the wire colors are different from those of Minebea Intec standard cables, refer to the specifications of the load cell.
- If the 6-wire cable length ≥100 m: the resistance of the cable causes the remote sensing function to fail and accuracy may not be covered under warranty.

4.2.2 4-wire connection cable

Connect CSD-918 to a load cell using a 4-wire cable as follows.

Note:

The colors listed here apply for the Minebea Intec load cell and connection cables of type "PR ..."



A	+ EXC	Load cell power supply V+	**red**
F	+ SEN	Sense S+	**white**
G	– SEN	Sense S–	**black**
C	– EXC	Load cell power supply V–	**blue**
D	+ SIG	Load cell signal (meas. voltage) M+	**green**

B	– SIG	Load cell signal (meas. voltage) M–	**gray**
E	SHIELD	Screen	**yellow**

Note:

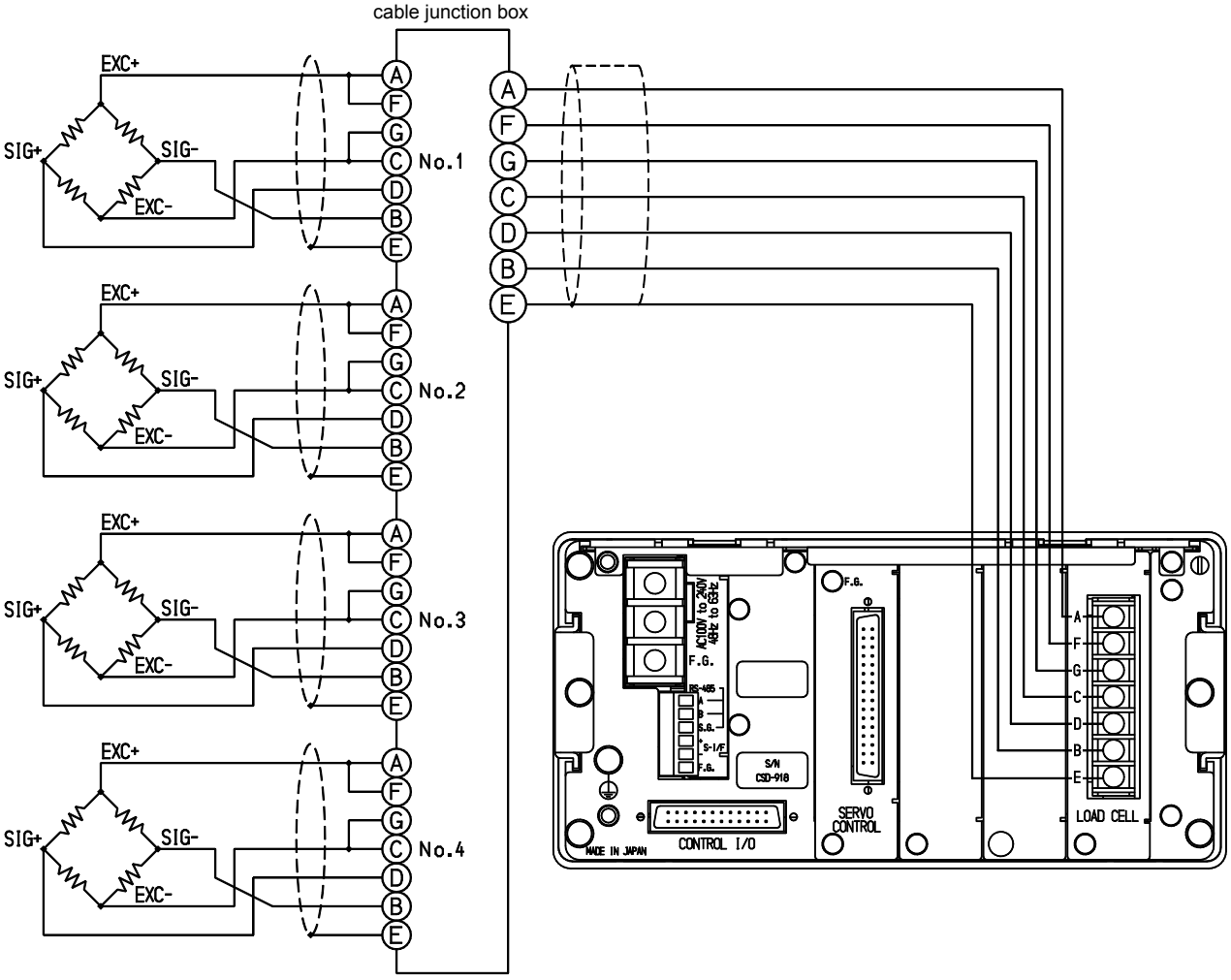
- When using a 4-wire cable, be sure to short between **A**-**F** and **C**-**G** on terminal block with the additional bridges. This device will not operate normally if terminals **F** and **G** are used in their open state.
- If the 4-wire cable ≥30 m: It is possible that the resistance of the cable will cause the input voltage of the device to decrease, resulting in accuracy outside of our guaranteed accuracy.

4.2.3 Connecting load cells in parallel

More than one load cell can be connected in parallel for use as a hopper scale or a truck scale. Cable junction box realizes easy parallel connection.

Note:

The colors listed here apply for the Minebea Intec load cell and connection cables of type "PR ..."

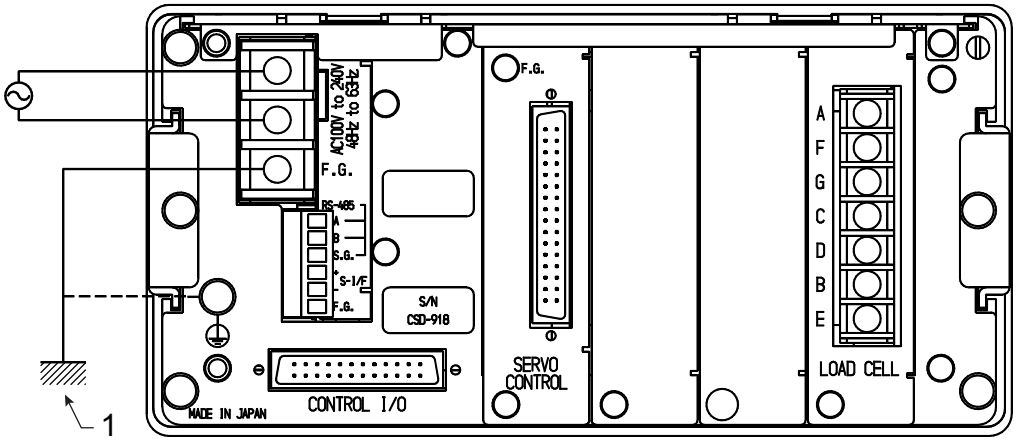


A	+ EXC	Load cell power supply V+	**red**
F	+ SEN	Sense S+	**white**
G	– SEN	Sense S–	**black**
C	– EXC	Load cell power supply V–	**blue**
D	+ SIG	Load cell signal (meas. voltage) M+	**green**
B	– SIG	Load cell signal (meas. voltage) M–	**gray**
E	SHIELD	Screen	**yellow**

4.3 Connection with power supply and the ground

Connect and ground the power supply with the terminals on the rear panel shown as below figure.

100 V AC to 240 V AC (Permissible range: 85 V AC to 264 V AC)



(1) D-class single grounding

⚠ CAUTION

Warning of personal injury.

- ▶ Connect the power supply and the ground correctly as shown in the figures and use within the prescribed power supply conditions (refer to Chapter 20.3.4).
- ▶ Since the CSD-918 does not have a power switch, a circuit breaker, etc. may need to be installed.

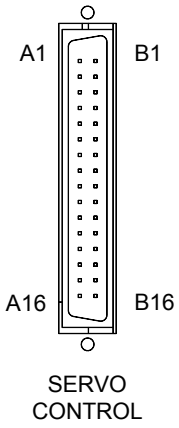
Note:

- Grounding should be D-class single grounding. Otherwise, noise from other devices may cause malfunctions.
- Perform single grounding with a protective earth terminal to ensure the device is compatible with CE mark applicable standards and JIS standards.

4.4 Connecting the servo control interface

This unit controls the servo motor by connecting the servo amplifier and its components to the servo control interface connector (SERVO CONTROL) on the rear panel. After wiring, the functions of PIN A5, A6 and B6 to B8 are activated by shorting across each input and COM 3 with a contact point or open collector.

(Open collector rating VCE = 35 V DC, IC = 40 mA DC MAX)



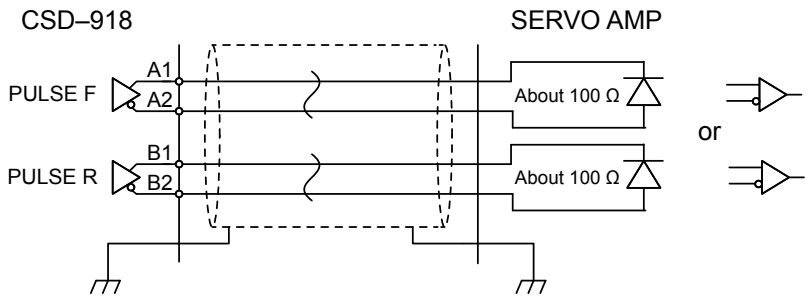
A1	OUT	PULSE F (+)	B1	OUT	PULSE R (+)
A2	OUT	PULSE F (-)	B2	OUT	PULSE R (-)
A3	IN	Encoder A-phase pulse (+)	B3	IN	Encoder B-phase pulse (+)
A4	IN	Encoder A-phase pulse (-)	B4	IN	Encoder B-phase pulse (-)
A5	IN	Alarm signal	B5	IN	Emergency stop signal
A6	IN	OPEN side limit signal	B6	IN	CLOSE side limit signal
A7	-	N.C.	B7	IN	Ready signal
A8	-	N.C.	B8	IN	original point sensor signal
A9	-	N.C.	B9	-	N.C.
A10	-	N.C.	B10	-	N.C.
A11	-	N.C.	B11	-	N.C.
A12	-	N.C.	B12	-	N.C.
A13	-	N.C.	B13	-	N.C.
A14	-	N.C.	B14	-	N.C.
A15	-	N.C.	B15	-	N.C.
A16	-	COM.3	B16	-	COM.3

Applicable connector: Connector FCN-361J032-AU; Connector cover FCN-360C032-B (Fujitsu)

Note:

Refer to Chapter 10.4 for details of servo controller interface signals.

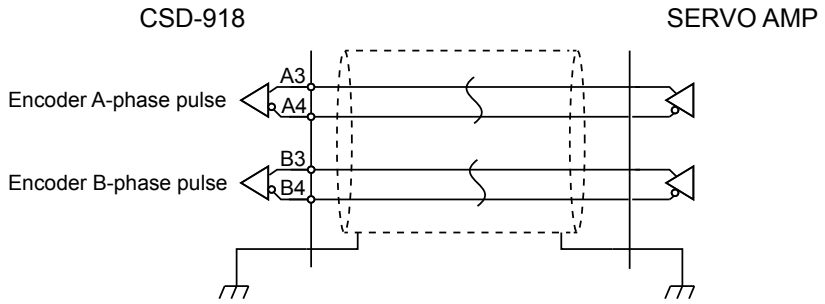
4.4.1 Connecting the PULSE F and PULSE R



Note:

- Use the shielded cable and connect the shield to the F.G. terminal to conform to CE mark applicable standards.
- Do not connect the N.C. pin.

4.4.2 Connecting the encoder A-phase pulse and encoder B-phase pulse



4.4.3 Connecting the emergency stop signal

Connect the b-contact switch for the emergency stop signal.

Connect it to COM 3 when the emergency stop signal is not used.

When emergency stop signal is used,
B5
Emergency stop signal — COM 3

When emergency stop signal is not used,
B5
Emergency stop signal — COM 3

⚠ CAUTION

Warning of personal injury.

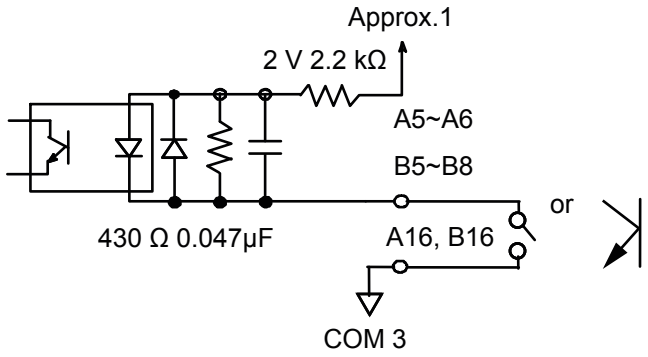
The system emergency stop does not work when used with the emergency stop signal connected to COM 3.

▶ Connect the b-contact switch for the emergency stop signal.

Note:

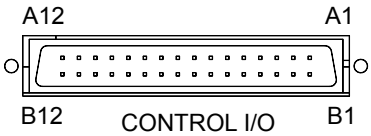
[SV.ERR EMG] is lit when the emergency stop signal is not connected or set correctly.

4.4.4 Connecting the input



4.5 Connecting the external control I/O

This function facilitates external control using the external control I/O connector on the rear panel. The external control input is executed by using a contact or open collector to bridge each input and COM 1 after wiring the connector.

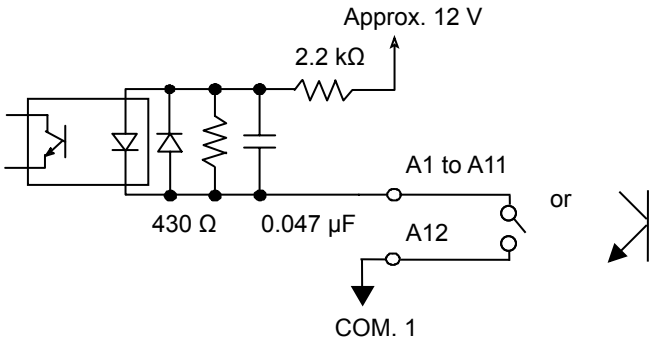


The external control output is an open collector output (Open collector rating: VCE = 35 V DC, IC = 40 mA DC at maximum).

The figure is an external control I/O connector.

The line from A1 to A12 is the input signal, and the line from B1 to B12 is the output signal.

4.5.1 Input connection



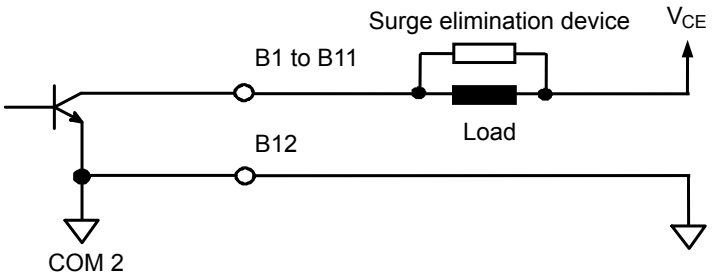
Applicable connector:
FCN-361J024-AU; Cover FCN-360C024-B (Fujitsu)

A1	Input 1
A2	Input 2
A3	Input 3
A4	Input 4
A5	Input 5
A6	Input 6
A7	Input 7
A8	Input 8
A9	Input 9
A10	Input 10
A11	Input 11
A12	COM 1

Note:

- For external control input recognition, there is a pulse input and level input, depending on setting parameter.
- Refer to Chapter 10.3.2 for details.
- The external control input common and the 2-pin method serial interface circuit common are connected.

4.5.2 Output connection



Open collector rating:
V_{CE} = 35 V DC, I_C = 40 mA DC

B1	Output 1
B2	Output 2
B3	Output 3
B4	Output 4
B5	Output 5
B6	Output 6
B7	Output 7
B8	Output 8
B9	Output 9
B10	Output 10
B11	Output 11
B12	COM 2

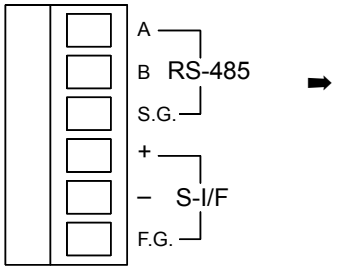
Note:

- The external control output common is insulated from the other commons.
- Refer to Chapter 10.3.3 for details.
- Connect a suitable surge elimination device for load protection from external control output.

4.6 Connecting a standard RS-485 interface

Connect to A, B and S.G. on the output terminals for RS-485 interface and the 2-pin method serial interface as shown below.

Refer to Chapter 16.5 for more information.



A Differential I/O (+)
B Differential I/O (-)
S.G. Signal ground
Applicable plug: XW4B-06B-H1 (OMRON)

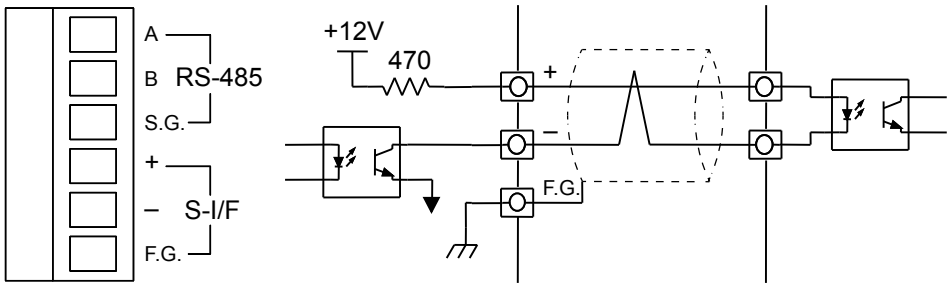
Note:

- Stripped length of the cable tip is 7 mm.
- The tightening torque of terminal screws on the terminal board is 0.22 to 0.25 Nm.
- Use AWG28 to AWG16 connecting cable.
- The signal ground of the standard RS-485 interface and the internal common are connected.
- Connect the shield to the F.G. terminal on the terminal board of the RS-485 interface or 2-pin method serial interface when CSD-918 conforms to CE mark applicable standards or JIS standards.

4.7 Connecting to a 2-pin method serial interface

The 2-pin method serial interface is used to connect to printers, external display units, etc.

The 2-pin method serial interface is connected with +, - and F.G., as shown in the below figure.



Applicable plug: XW4B-06B-H1 (by OMRON) | CSD-918 internal equivalent circuit | 2-pin method serial interface | corresponding equipment

Note:

- The length of the stripped wire cable tip is 7 mm.
- The tightening torque of terminal screws on the terminal board is 0.22 to 0.25 Nm.
- Use AWG28 to AWG16 connecting cable.
- Unipulse produce a "M252B" printer for equipment using a 2-pin method serial interface.
- Use 2-wire shielded cable if possible.

  The shield connects to the F.G. terminal.

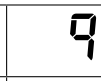
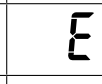
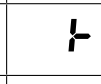
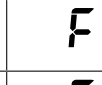
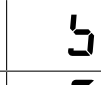
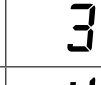
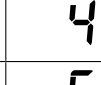
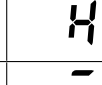
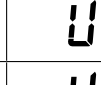
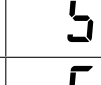
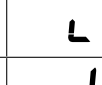
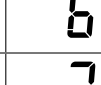
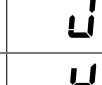
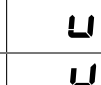
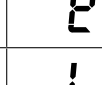
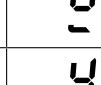
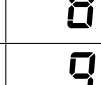
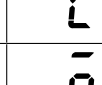
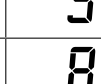
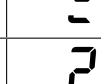
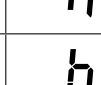
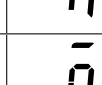
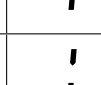
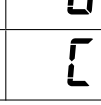
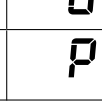
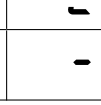
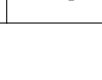
  The maximum shielded cable length is 100 m; For other cables it is 20 m.
- Up to 3 devices can be connected in parallel using the 2-pin method serial interface.

  Maximum output current : Approx. 20 mA DC
- The external control input common and the 2-pin method serial interface circuit common are connected.
- Connect the shield to the F.G. terminal on the terminal board of the RS-485 interface or 2-pin method serial interface when CSD-918 conforms to CE mark applicable standards or JIS standards.

5 Operations

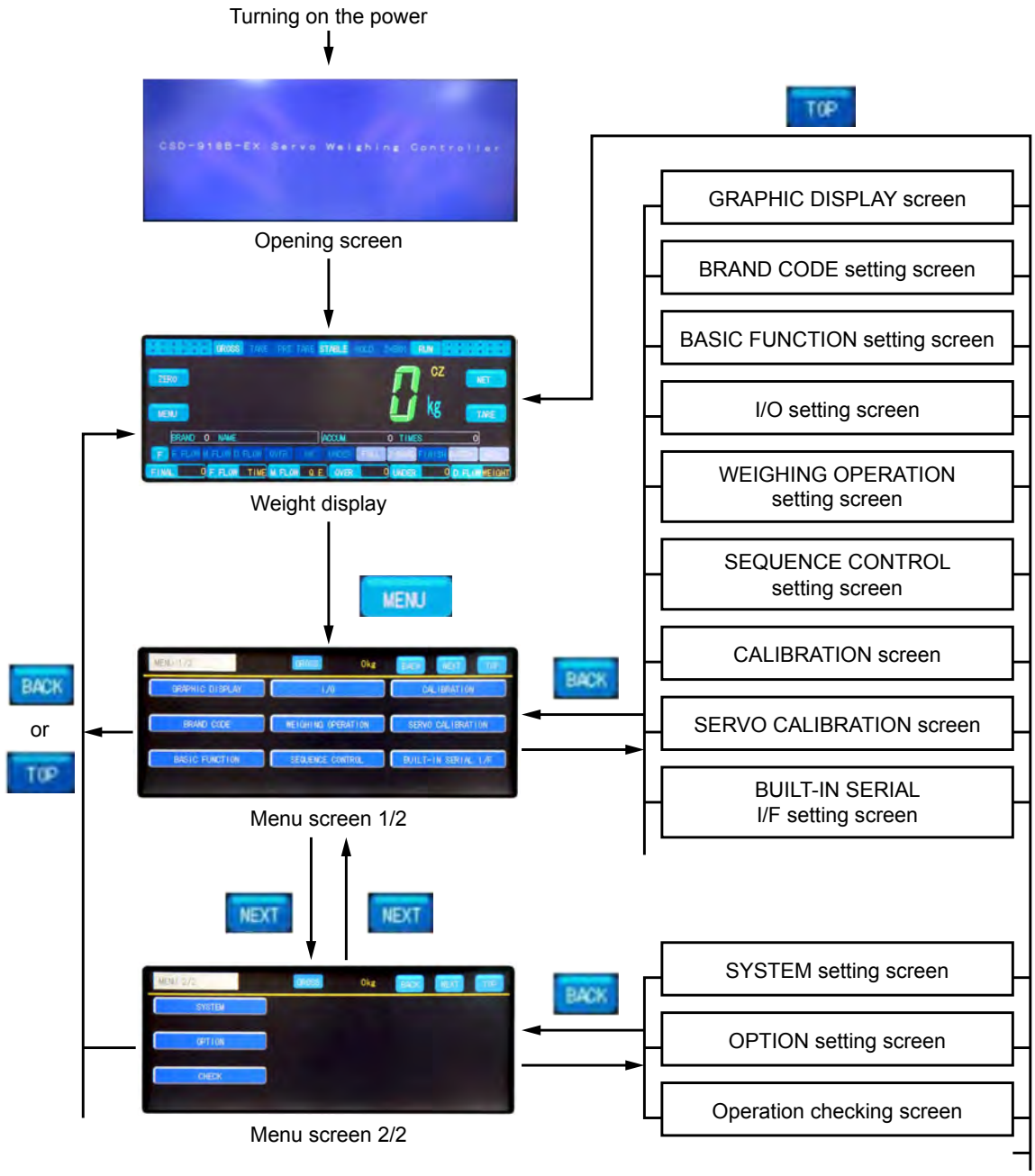
5.1 Character display pattern

The display pattern in seven segments indicator of this device is shown in the table below.

0		D		Q	
1		E		R	
2		F		S	
3		G		T	
4		H		U	
5		I		V	
6		J		W	
7		K		X	
8		L		Y	
9		M		Z	
A		N		?	
B		O		!	
C		P		-	

5.2 Change of screen

This unit prepares various setting screens according to the operating status.
You can change the screen by the tapping operation.



5.3 Variety of screen

The role of each screen is shown as follows.

1	GRAPHIC DISPLAY screen The change of load value in the time arbitrarily set in the graph can be displayed on this screen.
2	BRAND CODE setting screen The details of final value, fine flow, etc., for each brand can be set on this screen.
3	BASIC FUNCTION setting screen The display rate and A/D sampling rate, etc., can be set on this screen.

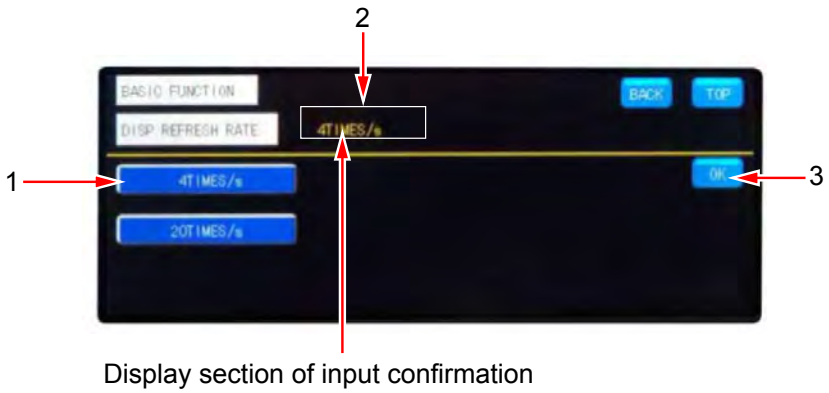
4	I/O setting screen F1 to F4 and the external control I/O can be set on this screen.
5	WEIGHING OPERATION setting screen The weighing operation such as weighing mode and control mode, etc., can be set on this screen.
6	SEQUENCE CONTROL setting screen The variety of items in the sequential mode can be set on this screen.
7	CALIBRATION screen The load calibration is executed to display the electrical signal from the weighing device (load cell) as an accurate load on this screen.
8	SERVO CALIBRATION screen The controls of a servo amplifier and a gate can be set on this screen.
9	BUILT-IN SERIAL I/F setting screen The details of standard RS-485 interface and 2-pin method serial interface can be set on this screen.
10	SYSTEM setting screen The time of back light off, the data storage and memory clearing, etc., can be set on this screen.
11	OPTION setting screen The details of the various options can be set on this screen.
12	Operation checking screen The operation of this unit and the various options can be checked on this screen.

5.4 The common setting method of each screen

The setting method of each item is executed as follows.

5.4.1 Setting method by selections

(example: set the display rate to 4 times/s.)



1. Press on the key (1) which you want to select.

   [4 TIMES/s] in this case.

2. Check that the selected content is reflected on the display section of input confirmation (2).
3. Tap [OK] (3) to execute the registration.

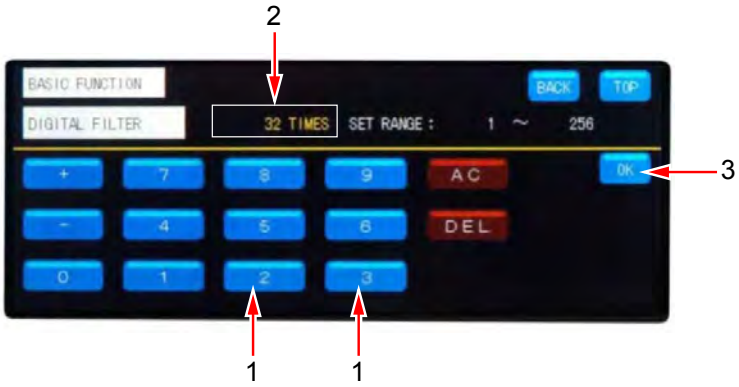
▷ The display changes to each item's display.

Please confirm that the selected contents are reflected under the item.

On each setting screen, the screen returns to the previous screen by tapping [BACK], and by tapping [TOP], to the screen returns to weighing screen.

5.4.2 Setting method by inputting an optional amount

(example: set the digital filter to "32 times")



1. Tap the ten keys (1) for the values to be set sequentially.

   In this case, it is [3] and [2].

2. Check that the selected numeric input with ten keys is reflected at the input display section (2).
3. Tap [OK] (3) to execute the registration.

   ▷ The screen changes to each item's screen.

   Confirm that the changed content is reflected under the changed key.

On numeric inputting screen, all input values are cleared by tapping [AC], and the minimum digit is deleted by tapping [DEL]. (By tapping [3], [2] and [DEL] sequentially, [2] is deleted and [3] is retained.)

On each setting screen, the screen returns to the previous screen by tapping [BACK], and by tapping [TOP], the screen returns to weighing screen.

6 Calibration

The calibration is an operation that matches the load of the load cell to the display of this unit to display the electrical signal from the weighing section (load cell) as accurate load. If the calibration is not processed, the correct display and the output cannot be taken.

For instance, this is the calibration that the display of this unit is to become a display of 100.00 kg accurately when the weight of 100 kg is applied on the weighing section.

6.1 Set items required in weighing calibration

- Load cell excitation (BRIDGE POWER SUPPLY)

  This is the voltage (DC) supplying for load cell. The setting value is selectable from [12V], [6V] or [3V]. [12V] is set as default.

- Scale interval (DIVISION)

  This is the minimum unit of weighing value. The setting value is selectable from [1], [2], [5], [10], [20] or [50]. The value of "Weighing capacity / Scale interval (Min. scale division)" is the display resolution.

- Maximum load (Max) (WEIGHING CAPACITY)

  This is the maximum load that can be measured in the weighing section (load cell).

- Zero calibration (ZERO ADJUSTMENT)

  This is the calibration that the weighing value becomes zero point of the scale when no load is applied (Initial load condition) on the weighing section. There are two calibration methods of "Weighing value (Initial load condition)" and "Numeric input of load cell output voltage".

- SPAN calibration (SPAN ADJUSTMENT)

  This is the calibration that the changes of the electrical signal from load cell become the display of right weighing value when the weight is put on the measuring section. There are two calibration methods for calibration of "weight" and "numeric input of output voltage of a load cell".

6.2 Set items if necessary after the calibration

- Fine calibration at ZERO and SPAN (FINE ADJUSTMENT)
- Pitch confirmation registration (PITCH COMFIRMATION)
- Digital linearise (DIGITAL LINEARISE)
- Position of decimal point (DECIMAL POINT)
- Display condition of OL (OL DISPLAY CONDITION)
- Unit (UNIT)
- Compensation of gravitational acceleration (ADJ. GRAV. ACCELERATION)

Note:

- Please execute the weighing calibration if necessary when a load cell and a system configuration used are changed.
- The display resolution that the performance becomes effective is 10 000 or less.
- Please use the calibration weight for the SPAN calibration to 2/3 or more of the max. load (Max) to reduce the calibration error.

6.3 Weighing calibration procedure

6.3.1 Flow of weighing calibration

Step 1	Connection with load cell	Connect this unit with a load cell.
	⇩	
Step 2	Energizing power supply	Turn on the power supply.
	⇩	
Step 3	Change weighing calibration screen	Change the screen to weighing calibration mode.
	⇩	
Step 4	Set excitation voltage	Set the bridge power supply (load cell excitation).
	⇩	
Step 5	Energizing for 10 min	To stabilize the unit and the load cell, put this unit into the status of energizing for about 10 min.
	⇩	
Step 6	Set scale interval (Minimum scale) see Chapter 6.3.4	Set the minimum unit of weighing.
	⇩	
Step 7	Set max. load (Max) see Chapter 6.3.5	Set the maximum load (Max) that can be weighed by the load cell.
	⇩	
Step 8	Calibration of zero see Chapter 6.3.6	Calibrate the zero point by the condition of no load at the load cell, or by setting the output voltage of zero of the load cell.
	⇩	
Step 9	Calibration of SPAN see Chapter 6.3.7	Calibrate the SPAN point by the condition of putting the weight on the load cell, or by setting the output voltage for the load cell SPAN.
	⇩	
Step 10	Finish the calibration	Finish the calibration.
	⇩	
	Execute the following steps, if necessary.	

		see Chapter
Step 11	Fine calibration at zero and SPAN	6.4
Step 12	Confirmation and registration of pitch	6.5
Step 13	Digital linearization	6.6
Step 14	Position of decimal point	6.8.1
Step 15	Display condition of [OL]	6.8.2
Step 16	Unit	6.8.3
Step 17	Compensation of gravitational acceleration	6.8.4

6.3.2 Change to weighing calibration screen

Please switch from weighing screen to weighing calibration screen by the following operation.

1. Tap [MENU]
2. Tap [CALIBRATION] on the menu screen 1/2.

6.3.3 Excitation voltage (BRIDGE POWER SUPPLY)

The excitation voltage (DC) for load cell can be set.

▶ By tapping [BRIDGE POWER SUPPLY] in weighing calibration screen 2/2, select the voltage from [12 V], [6 V] or [3 V].

[12 V] is selected as default.

When CSD-918 is applied for the system where a zener barrier is used, select the excitation voltage [BRIDGE POWER SUPPLY] properly according to the below table.

System configuration	Excitation voltage (Bridge power supply)		
	12 V DC	6 V DC	3 V DC
1 load cell + zener barrier	X	X	○
2 load cells + cable junction box + zener barrier	X	X	○
3 load cells + cable junction box + zener barrier	X	X	○
4 load cells + cable junction box + zener barrier	X	X	○

○: Applicable

X : Not applicable.

The above are the examples when 6-wire cable and 350 Ω type of load cell are applied.

6.3.4 Set of scale interval (DIVISION)

Set the scale interval (min. scale division).

▶ Select [DIVISION] in weighing calibration screen 1/2, and select one from [1],[2],[5],[10],[20] or [50].

6.3.5 Set of max. load (Max) (WEIGHING CAPACITY)

Set the max. load (Max).

▶ Select [WEIGHING CAPACITY] in weighing calibration screen 1/2, and input any arbitrarily numeric value in the range from [1] to [999 999].

Note:

The display resolution that the performance becomes effective is 10 000 or less.

6.3.6 Zero calibration (ZERO ADJUSTMENT)

The input at zero point is registered.

There are two methods for zero calibration.

- Calibration method by weight

- Calibration method by inputting the numeric value of load cell voltage output

Note:

- The value displayed under the [ZERO CALIBRATION] is initial load conversion value in the calibration condition after executing zero calibration and SPAN calibration. Please use it as the basic value of the initial load value (tare weight amount) after calibration. In addition, it may not be shown when the value has exceeded the capable range of the display, for instance the initial load value is big and max. load (Max) is small.
- The calibration accuracy obtained in Chapter 6.3.6 is less than 1/1000 or so. When precise accuracy more than 1/1000 is necessary, please calibrate by "Calibration method with weight", see Chapter 6.3.6.1.

6.3.6.1 Calibration method by weight (Initial load condition)

ZERO is calibrated with nothing put on the weighing part.

1. Please set the condition that nothing is put on the weighing section.
2. Select [ZERO ADJUSTMENT] on the calibration menu screen 1/2. (Zero display).
3. Tap [OK].
   ▷ The message of [Execute ZERO calibration?] displays
4. Tap [YES].

   If you would interrupt the calibration, tap [NO], and then tap [BACK] or [TOP] to continue.

   ▷ [ZERO] blinks on the load display section.

   When the screen returns to the calibration screen 1/2 after the [ZERO] blinking, the registration of zero point is finished.

6.3.6.2 Method by inputting the numeric value of load cell voltage output

This is the method for ZERO registration by setting the load cell output voltage value at zero point.

Please input the arbitrary value in the range from [-2.500 00 mV/V] to [2.500 00 mV/V].

1. Select [ZERO POINT mV/V] on the calibration screen 1/2.

   (The zero point input value adjusted at the shipment or calibrated at last time is displayed.)
2. Please input the load cell output voltage corresponding to zero point with ten key in the unit of mV/V.
3. Check that the content of numeric value input with ten key is displayed on the input check display section.
4. Tap [OK].

   If the input value is displayed at the below of [ZERO POINT mV/V] after returning to the calibration screen 1/2, the registration of zero is finished.

Note:

Error display of Zero calibration

[TE-L]: Blinks for about 2 second when load cell output voltage is lower than -2.5 mV/V (Refer to Chapter 19.2).

[TE-H]: Blinks for about 2 second when load cell output voltage is higher than 2.5 mV/V (Refer to Chapter 19.2).

6.3.7 SPAN calibration (SPAN ADJUSTMENT)

The input at SPAN is registered.

There are two methods for SPAN calibration.

- Calibration method with weight
- Calibration method by numeric input of load cell output voltage

6.3.7.1 Calibration method with weight

SPAN calibration is proceeded with the weight put on the weighing section.

1. Select [SPAN ADJUSTMENT] on weighing calibration screen 1/2.
2. Please input the value of the weight applied on the weighing section actually.

   When there is the same mass of weight as the weighing capacity, please input the same amount as the max. load (Max).

   If there is not the same calibration weight as the max. load, please input the amount of weight to be used for calibration.
3. Check that the inputted content on the input confirmation display section with ten keys is reflected.
4. Tap [OK].
   ▷ The message of [Has ZERO calibration completed? Execute SPAN calibration?] is appeared.
5. Tap [YES].

   Tap [NO] to interrupt the calibration, and tap [BACK] or [TOP] to proceed.

   ▷ The [SPAN] display blinks in the load display section.

   If the display has returned to load calibration screen 1/2 after blinking the [SPAN], the SPAN registration is finished.

Note:

Please use the calibration weight for the SPAN calibration to be used for the amount of 2/3 or more of the max. load (Max) to reduce the calibration error.

6.3.7.2 Calibration method by numeric input of load cell output voltage

This is the method of SPAN registration by inputting the difference subtracted from the output voltage at span of load cell to the output voltage at zero point.

Please input the arbitrary amount in the range from [0.000 01 mV/V] to [3.100 00 mV/V].

1. Tap [SPAN POINT mV/V] at the calibration screen 1/2.

(The input value of SPAN adjusted at the shipment, or calibrated at last time is displayed.)

2. Please Input the difference of the load cell output value between equivalent to the weighing capacity and equivalent to the zero point in mV/V.
3. Check that the content input with ten key is reflected on the input check display.
4. Tap [OK].

   The SPAN registration is finished if the input value is reached below the [SPAN POINT mV/V] in load calibration screen 1/2.

Note:

Error display of the span calibration

SP-L [SP-L]: Blinking for about 2 second when ([Load cell output voltage at SPAN] – [Load cell output voltage at ZERO]) ≤ 0.0 mV/V (refer to Chapter 19.2).

SP-H [SP-H]: Blinking for about 2 second when ([Load cell output voltage at SPAN] – [Load cell output voltage at ZERO]) > 3.1 mV/V or when load cell output voltage exceeds 3.1 mV/V (refer to Chapter 19.2).

Note:

The calibration accuracy obtained in Chapter 6.3.7 is less than 1/1000 or so.

When precise accuracy more than 1/1000 is necessary, please calibrate by "Calibration method with weight".

6.4 Fine adjustment at Zero and SPAN (FINE ADJUSTMENT)

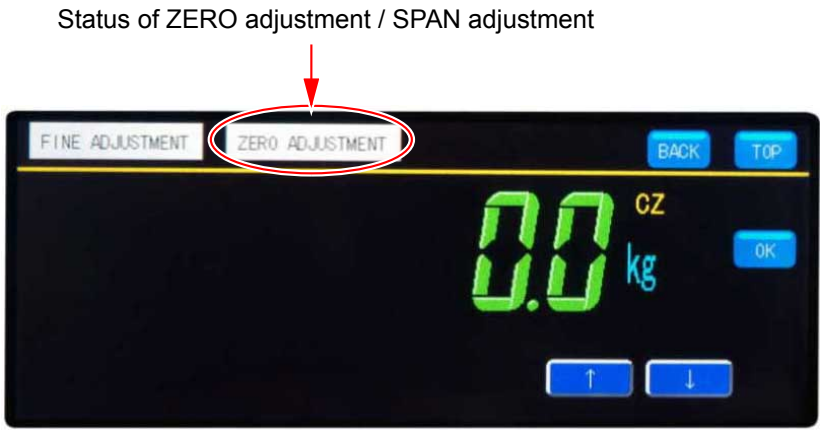
This function is fine calibration of zero and SPAN when there is the different margin in an actual weight and the calibration weight.

6.4.1 Changeover to fine calibration screen

Please switch from weighing screen to weighing calibration screen by the following procedure.

1. Select [MENU].
2. Select [CALIBRATION] in menu screen 1/2.
3. Tap [NEXT] in load calibration screen 1/2.
4. Select [FINE ADJUSTMENT] in load calibration screen 2/2.

6.4.2 Fine calibration of zero and SPAN



6.4.2.1 Zero calibration

1. Select [ZERO POINT ADJUSTMENT] on fine calibration screen.
   ▷ A present weighing value with 1/10 digit (DIVISION) is displayed.

   After the condition with no load applied on the weighing section.
2. Please calibrate the display to zero by using the increase ↑ and the decrease ↓.

   (By pressing them continuously, increment can be provided continuously.)

   After the calibration of zero point.
3. Tap [OK] to return to weighing screen.

6.4.2.2 SPAN calibration

1. Select [SPAN POINT ADJUSTMENT] on fine calibration screen.
2. Apply the calibration weight which can be put on the load cell and also less than the max. load (Max).
   ▷ The display becomes the present weighing value with the 1/10 digit (DIVISION).
3. Adjust the displayed value by using the increase ↑ and the decrease ↓ to become the same weight value applied on the weighing section.

   (By pressing them continuously, increment can be provided continuously.)

   After the adjustment of span point
4. Tap [OK] to return to weighing screen.

6.5 Registration and confirmation of pitch (PITCH CONFIRMATION)

This is a function to register up to 6 points of A/D count rate in an arbitrary point during the calibration of zero and SPAN, and to confirm the load indicated value of each pitch in the point registered after the calibration of SPAN.

Note:

- The actual weighing value displayed on pitch confirmation screen is a corresponding value to each registered A/D count value in the registered content from zero to SPAN.
- When the registered contents from zero to SPAN are switched, the actual weighing value displayed is switched also.

6.5.1 Switch to registration and confirmation screen of pitch

You can switch from weighing screen to registration screen of pitch confirmed by the following operations.

1. Select [MENU].
2. Select [CALIBRATION] on menu screen 1/2.
3. Select [PITCH CONFIRMATION SET] on load calibration screen 2/2.
4. The message of [Has zero calibration completed?] is appeared. Tap [YES].

6.5.2 Registration and confirmation method of pitch

1. Please put the weight to be registered on weighing section.

   After the stability of pitch confirmation and registration screen lights.
2. Tap [READ] whose number you want to register with.
   ▷ The message of [Other than the SPAN point?] is appeared.
3. Tap [YES].
   ▷ The registered value is confirmed.
4. Tap [OK].
5. Please repeat the operation of Step 1 to Step 4 when there are two or more points of pitch.

   You can register up to six points of pitch.

   After registration is completed.
6. Tap [BACK] to load calibration screen.

6.5.3 Pitch confirm method

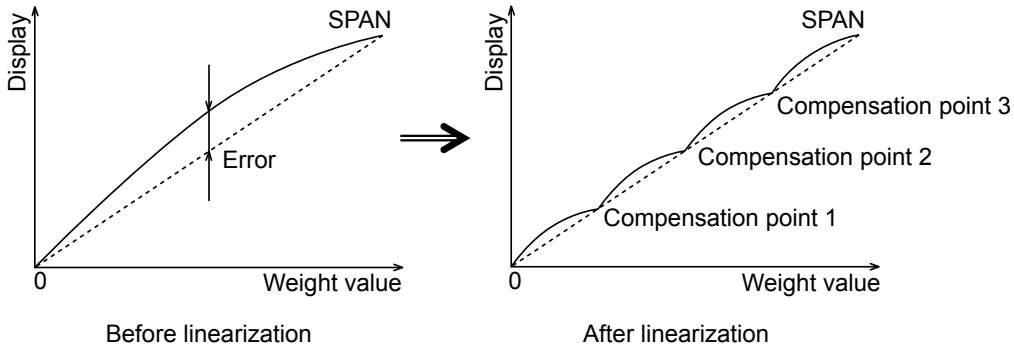
1. Select [PITCH CONFIRMATION] on weighing calibration screen 1/2.
   ▷ The list of the registered weighing value actually is displayed in the number section where registration was executed in Chapter 6.5.2.

   After confirmation.
2. Tap [BACK] to return to weighing calibration screen.

6.6 Digital linearization (DIGITAL LINEARISE)

After the calibration, weighing error of some scale intervals between the zero and SPAN (max. load) might occurs due to the influence of load cell.

The digital linearization is a function to execute the compensation for up to 3 points except for zero and SPAN, and to reduce the weighing error.



Note:

- Please set the weight value by which you are going to compensate as COMPENSATION POINT 1 < COMPENSATION POINT 2 < COMPENSATION POINT 3.
- The compensation of linearization more than max. load (Max) is not accepted.
- When digital linearization clear is executed, all of the compensated value of linearization becomes clear.

6.6.1 Switch to digital linearize screen

You can switch from weighing screen to digital linearization screen by the following operations.

1. Select [MENU].
2. Select [CALIBRATION] on menu screen 1/2.
3. Tap [NEXT] on weighing calibration screen 1/2.
4. Tap [DIGITAL LINEARIZE] on weighing calibration screen 2/2.

6.6.2 Setting method of digital linearization

1. Select [LINEARIZE COMPENSATION 1] on digital linearization screen.
2. Put the weight of the point that you want to compensate on weighing section.
3. Input the same numerical value as the weight value applied on the load cell with ten keys.

   Please confirm that the input value is reflected on the input confirmation display section.
4. Tap [OK].

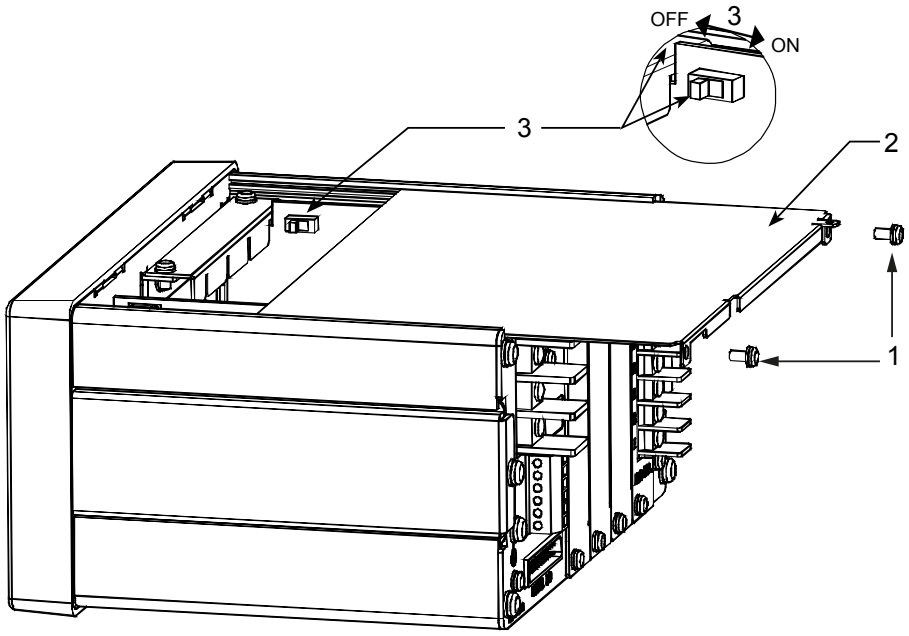
   Digital linearization is finished when the screen is switched to digital linearization screen.
5. Please process the same operation as the above mentioned for the setting of compensation point 2 and compensation point 3.

6.6.3 Clearing method of digital linearization

1. Select [LINEARIZE CLEAR] on digital linearization screen.
2. Select [EFFECTIVE] and then tap [OK].

6.7 CAL-switch

Lock calibration settings to protect them from changes. Use the CAL switch to lock the calibration settings.



1. Remove the (two) fixing screws (1) of the upper cover (2).
2. Slide the upper cover (2) toward the rear panel to remove it.
3. Switch the CAL switch (3) ON.

   To release the lock, switch the CAL switch OFF.

Note:

When the calibration is locked, the various setting listed below cannot be switched.

MENU screen	BASIC FUNCTION	CALIBRATION	SERVO CALIBRATION	OPTION
Each setting screen	A/D SAMPLING RATE	ZERO ADJUSTMENT	CONFIGURATION	ANALOG OUTPUT
	OPERATION OF ZERO	SPAN ADJUSTMENT	FULL OPEN TYPE1	
	RANGE OF ZERO	WEIGHING CAPACITY	FULL OPEN TYPE2	
	TARGET OF ZERO TRACKING	DIVISION		
	ZERO TRACKING TIME	ZERO POINT mV/V		
	ZERO TRACKING BAND	SPAN POINT mV/V		

OPERATION OF TARE	DECIMAL POINT
RANGE OF TARE	UNIT
ZERO AT POWER ON	BRIDGE POWER SUPPLY
ZERO CLR.AT POWER ON	OL DISPLAY CONDITION
TARE AT POWER ON	ADJ.GRAV.ACCELERATION
TARE CLR.AT POWER ON	CALIB. PLACE No.
OPERATION OF STABILITY	OPERATION PLACE No.
	CALIB. PLACE G.A.
	OPERATION PLACE G.A.
	FINE ADJUSTMENT
	DIGITAL LINEARISE
	PITCH CONFIRMATION SET
	PITCH CONFIRMATION

6.8 Various functions set by the other calibration screen

6.8.1 Position of decimal point (DECIMAL POINT)

The decimal point is selectable from [0], [0.0], [0.00], [0.000] or [0.0000].

[0] is selected as default.

6.8.2 Display condition of OL (OL DISPLAY CONDITION)

The display condition of over is selectable from [+ 9D], [±110 %] or [-20D ~ 9D].

[+ 9D] is selected as default.

6.8.3 Unit (UNIT)

The unit is selectable from [no display], [g], [kg], [t], [lb], [N] or [kN].

[no display] is selected as default.

6.8.4 Compensation of gravitational acceleration

When the calibration place of scale is different from its using place, an error at span is caused due to the gravitational acceleration of each district.

The compensation function of gravitational acceleration corrects the span error by setting the two district number or the two gravitational acceleration number between the calibration place and its using place.

If the calibration place and its using place is the same, the compensation of gravitational acceleration is not required.

Note:

Confirm the details of the gravitational acceleration by the service of the gravity data on the homepage of "Science chronology" and Geographical Survey Institute, etc. (http://vldb.gsi mc.go.jp/sokuchi/gravity/calc/gravity.pl)

6.8.4.1 Compensation method of gravitational acceleration (ADJ. GRAV. ACCELERATION)

The compensation method of gravitational acceleration is selectable from [DISTRICT NUMBER] or [GRAVITATIONAL ACCELERATION].

[DISTRICT NUMBER] is selected as default.

6.8.4.2 District number of its using place (OPERATION PLACE No.)

(When the compensation method of gravity acceleration is [DISTRICT NUMBER].)

Set the district number of using place.

Setting of district number [01] to [16]

10 is selected as default.

Refer the tables for "Compensational list for the gravitational acceleration" shown in the next page.

6.8.4.3 District number of calibration place (CALIB. PLACE No.)

(When the compensation method of gravitational acceleration is [DISTRICT NUMBER].)

Set the district number for the calibration place.

Setting of the district number: [01] to [16]

10 is selected as default.

Refer to "the compensation table of gravitational acceleration" showing as below.

6.8.4.4 Gravitational acceleration of using place (OPERATION PLACE G. A.)

(When the compensation method of gravitational acceleration is the gravitational acceleration.)

Set the gravitational acceleration value for the using place.

Setting range: [9.000] to [9.999]

9.797 is set as a default.

Refer to "the compensation table of gravitational acceleration" showing as below.

6.8.4.5 Gravitational acceleration of the calibration place (CALIB. PLACE G. A.)

(When the compensation method of gravitational acceleration is the gravitational acceleration.)

Set the gravitational acceleration value for the calibration place.

Setting range: [9.000] to [9.999]

9.797 is selected as default.

Refer to "the compensation table of gravitational acceleration" showing as below.

6.8.4.6 Table of gravitational acceleration correction

District number	Gravity acceleration [m/s^2]	District
1	9.806	Kushiro, Kitami, Abashiri, Rumoi, Wakkanai, Monbetsu, Nemura, Souya Branch Administrate, Rumoi Branch Administrate, Abashiri Branch Administrate, Nemuro Branch Administrate, Kushiro Branch Administrate
2	9.805	Sapporo, Otaru, Asahikawa, Yubari, Iwamizawa, Bibai, Ashibetsu, Ebetsu, Akahira, Dobetsu, Furano, Nayori, Mikasa, Chitose, Tatsukawa, Sunagawa, Utashinai, Fukagawa, Eniwa, Ishikari Branch Administrate, Shiribe Branch Administrate, Kamikawa Branch Administrate, Sorachi Branch Administrate
3	9.804	Hakodate, Muroran, Obihiro, Tomakomai, Tobetu, Date, Watashima Branch Administrate, Hiyama Branch Administrate, Iburi Branch Administrate, Hidaka Branch Administrate, Tokachi Branch Administrate
4	9.803	Aomori Pref.
5	9.802	Iwate Pref. Akita Pref.
6	9.801	Miyagi Pref. Yamagata Pref.
7	9.800	Fukushima Pref. Ibaragi Pref. Niigata Pref.
8	9.799	Tochigi Pref. Toyama Pref. Ishikawa Pref.
9	9.798	Gunma Pref. Saitama Pref. Chiba Pref. Tokyo (excluding Hachijo Branch Administrate and Ogasawara Brandh Administrate), Fukui Pref. Kyoto Pref. Tottori Pref. Shimane Pref.
10	9.797	Kanagawa Pref. Yamanashi Pref. Nagano Pref. Gifu Pref. Shizuoka Pref. Aichi Pref. Mie Pref. Wakayama Pref. Shiga Pref. Osaka Pref. Hyogo Pref. Nara Pref. Okayama Pref. Hiroshima Pref. Yamaguchi Pref. Tokushima Pref. Kagawa Pref.
11	9.796	Tokyo (Hachijo Branch Administrate), Ehime Pref. Kochi Pref. Fukuoka Pref. Saga Pref. Nagasaki Pref. Oita Pref.
12	9.795	Kumamoto Pref. Miyazaki Pref.
13	9.794	Kagoshima Pref. (excluding Nase and Oshima)
14	9.793	Tokyo (Ogasawara Branch Administrate)
15	9.792	Kagoshima Pref. (Nase and Oshima)
16	9.791	Okinawa Pref.

7 Servo calibration

The item to control a servo amplifier is set.

7.1 Set items to control a servo amplifier

- Registration of equipment configuration (CONFIGURATION)

  The specification value and the set value of servo amplifier and servo motor used are registered.

- Input effective state (INPUT ENABLED STATE)

  An effective input of the servo control interface used with the system is set.

- Calibration of manual speed (MANUAL SPEED CALIB.)

  The speed at the gate in manual operation is calibrated.

- Position calibration (POSITION CALIB.)

  The position of the gate is calibrated.

- Software limit (SOFTWARE LIMIT)

  The limit is set to the position of the gate with software for the result of a positional calibration.

⚠ CAUTION

Damage to the system or malfunctions are possible.

- ▶ Set each parameter after confirming the specification of this unit and servo amplifier and the servo motor used enough.
- ▶ Calibrate the servo if necessary when changing a servo amplifier or servo motor, or changing the system configuration around the valve.

Note:

Please calibrate the servo after executing the procedure in Chapter 6.

7.2 Procedure of servo calibration

7.2.1 Servo calibration flow

	Weighing calibration see Chapter 6	
	⇩	
Step 1	Register configuration see Chapter 7.3	Rated motor rotating speed, maximum input pulse frequency, command pulse method, command pulse polarity, command pulse logic, input pulse per rotation and output pulse per one rotation are registered.
	⇩	
Step 2	Input effective state see Chapter 7.4	Set the effective state of alarm input signal, original point sensor, ready, limit of OPEN side and limit of CLOSE side.
	⇩	
Step 3	Manual speed calibration see Chapter 7.5	Calibrate the gate speed for high speed and slow speed.
	⇩	
Step 4	Positional calibration see Chapter 7.6	The original point and the final point are calibrated after selecting the detecting method of the original point from TYPE1, TYPE2 and TYPE3, and the final point from TYPE1 and TYPE2.
	⇩	
Step 5	Manual operation see Chapter 7.7	Manual gate operation is executed.
	⇩	
Step 6	Software limit see Chapter 7.8	Set the software limit of the OPEN side, CLOSE side and deflection.

7.3 Registration of equipment configuration (CONFIGURATION)

The specification value and the set value of the servo amplifier and the servo motor used are registered.

7.3.1 Switch to registration screen of equipment configuration

Switch from weighing screen to registration screen of equipment configuration by the following operations.

1. Select [MENU].
2. Select [SERVO CALIBRATION] at menu screen 1/2.
3. Select [CONFIGURATION] at servo calibration screen.

7.3.2 Rated motor rotating speed (RATED MOTOR SPEED)

Set the rated motor rotating speed [min^{-1}] of servo motor used.

The setting range is 500 to 10 000 [min^{-1}].

3 000 [min^{-1}] is set as default.

1. Select [RATED MOTOR SPEED] at configuration screen.

2. Input the rating motor rotating speed [min^{-1}] of servo motor with ten keys.
3. Tap [OK].

7.3.3 Maximum frequency of input pulse (MAX. INPUT PULSE FREQ.)

Set the maximum frequency of input pulse [PPS] of servo amplifier used.

The setting range is 20 to 8 000 000 PPS.

1 000 000 PPS is set as default.

1. Select [MAX.INPUT PULSE FREQ.] at configuration screen.
2. Input the maximum frequency [PPS] of input pulse by ten key.
3. Tap [OK].

7.3.4 Command pulse method (COMMAND PULSE TYPE)

Set the command pulse method of servo amplifier used.

The pulse method is selectable from [1PULSE METHOD], [2PULSE METHOD] or [2PHASE PULSE METHOD].

[2PULSE METHOD] is set as default.

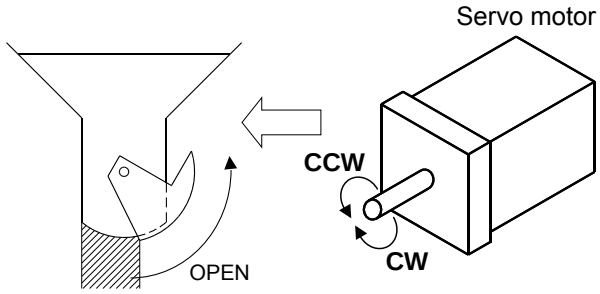
1. Select [COMMAND PULSE TYPE] at configuration screen.
2. Select the command pulse method.
3. Tap [OK].

7.3.5 Command pulse polarity (COMMAND PULSE POLARITY)

Set the system command pulse polarity of the gate in the OPEN direction.

The command pulse polarity can be selected from [CW] and [CCW].

[CCW] is the default.



1. Select [COMMAND PULSE POLARITY] on the configuration screen.
2. Select the command pulse polarity.
3. Tap [OK].

7.3.6 Command pulse logic (COMMAND PULSE LOGIC)

Set the command pulse logic of servo amplifier.

The command pulse logic is selectable from [POSITIVE LOGIC] or [NEGATIVE LOGIC].

[POSITIVE LOGIC] is set as default.

1. Select [COMMAND PLUSE LOGIC] at configuration screen.
2. Select the output logic of pulse.
3. Tap [OK].

7.3.7 Input pulse per one rotation of a motor (INPUT PULSE/REV.)

Set the input pulse necessary for one rotation of a servo motor. Set the command pulse input from this unit to the servo amplifier.

The setting range is [20 pulse ~ (8 000 000 / (rated motor rotation / 60)) pulse].

[131 072 pulse] is set as default.

1. Select [INPUT PULSE/REV] at configuration screen.
2. Input the input pulse per one rotation of servo motor with ten keys.
3. Tap [OK].

⚠ CAUTION

Damage to the system or malfunctions are possible.

- If the setting value is changed, the end position must be recalibrated, see Chapter 7.6.5 or 7.6.6.

7.3.8 Output pulse per one rotation (OUTPUT PULSE/REV.)

Please input the encoder pulse value that the servo amplifier outputs to this unit as an output pulse value per one rotation of servo motor.

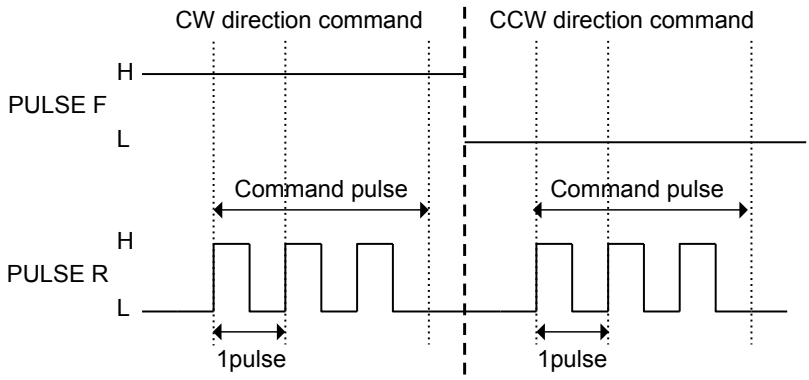
Setting range is 20 to 1 073 741 824 pulse.

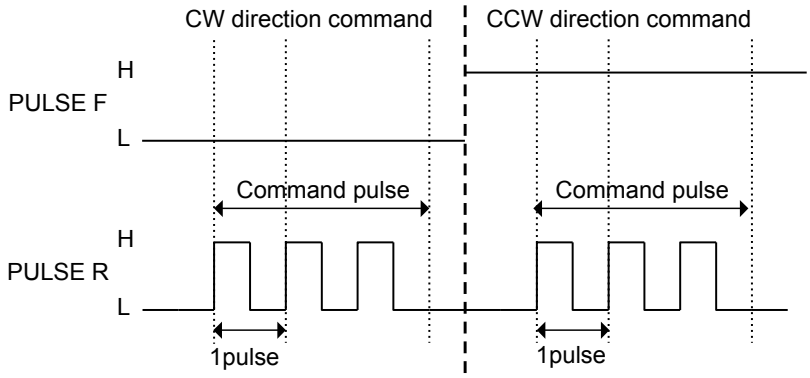
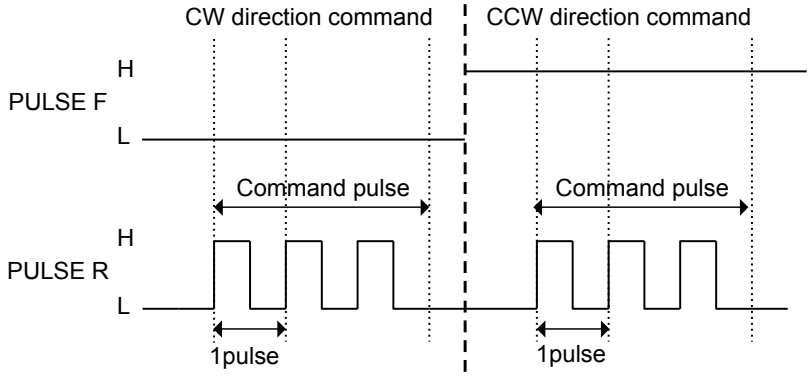
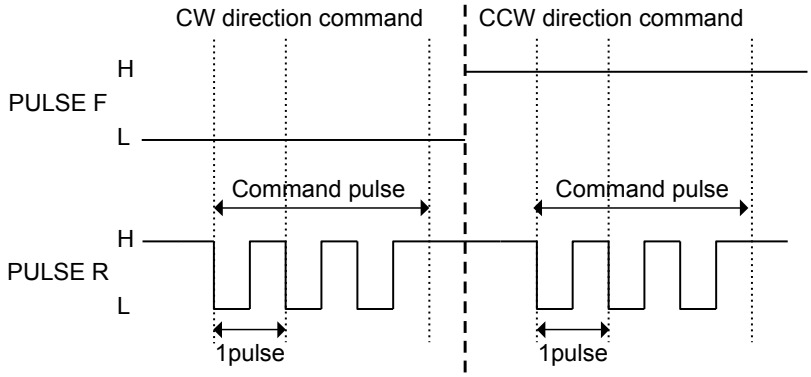
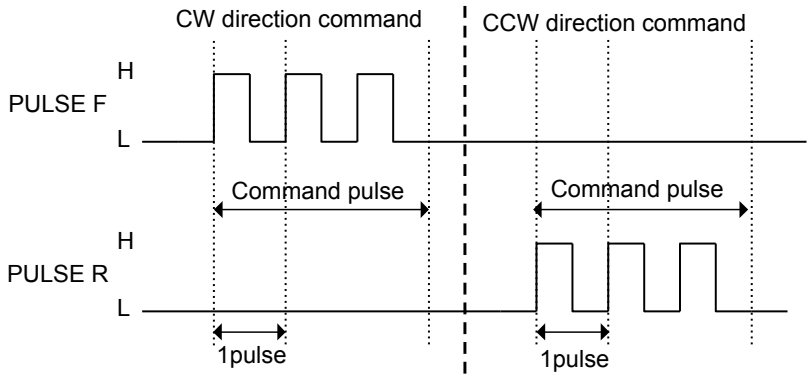
The default has set as 131 072 pulse.

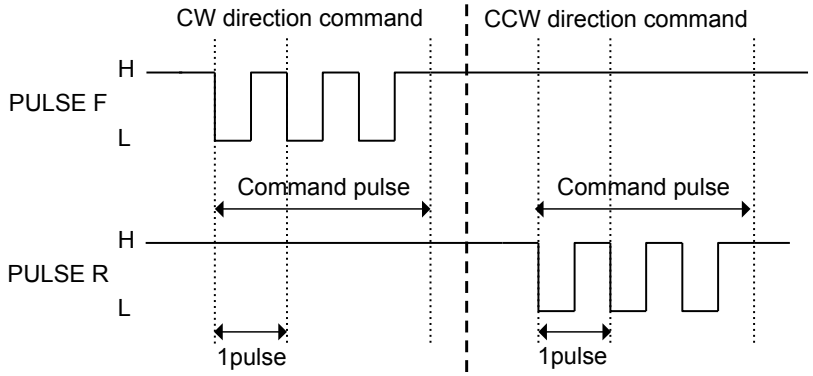
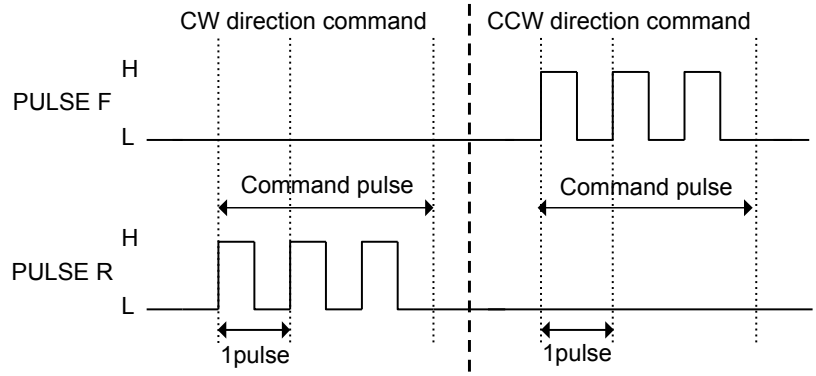
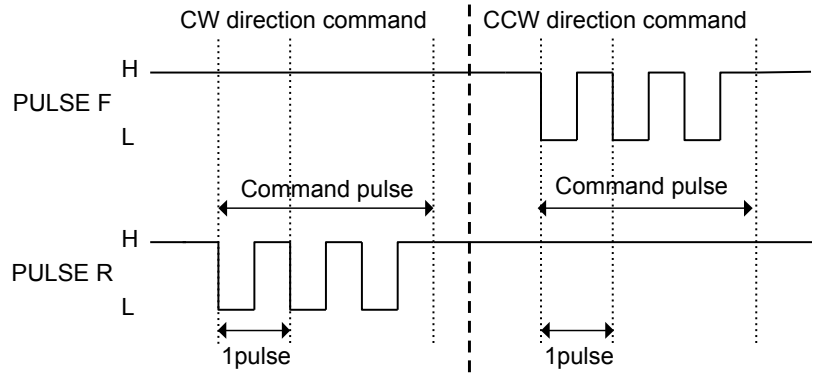
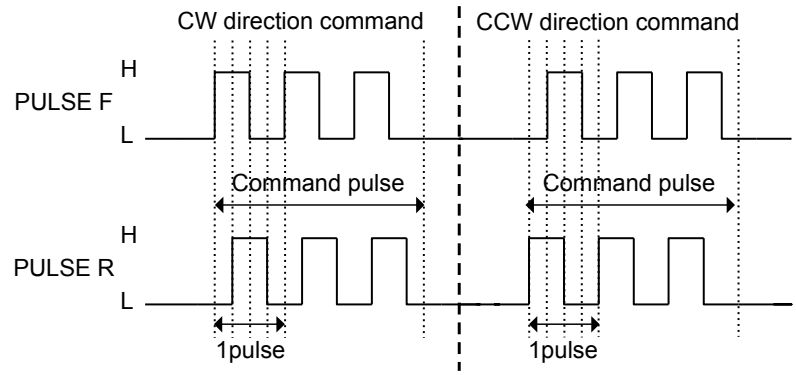
1. Select [OUTPUT PULSE/REV.] at configuration screen.
2. Input the output pulse value necessary for one rotation of the servo motor with ten keys.
3. Tap [OK].

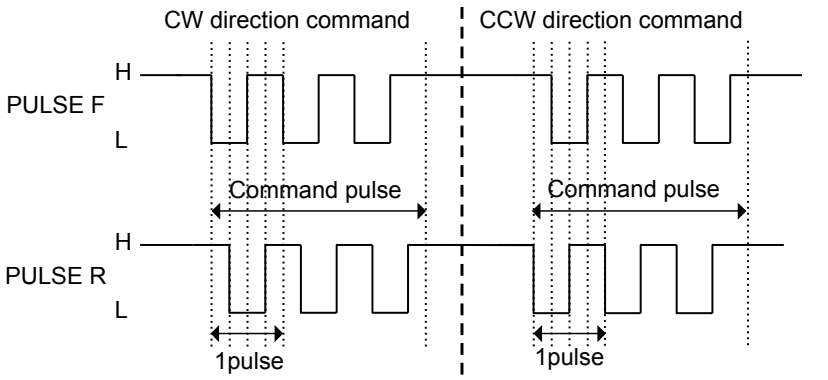
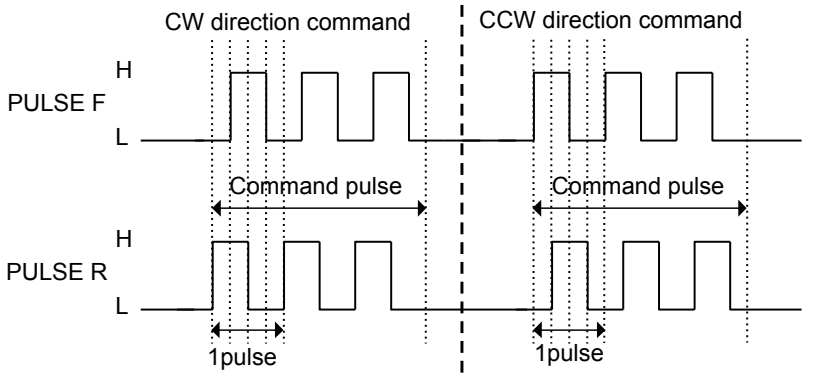
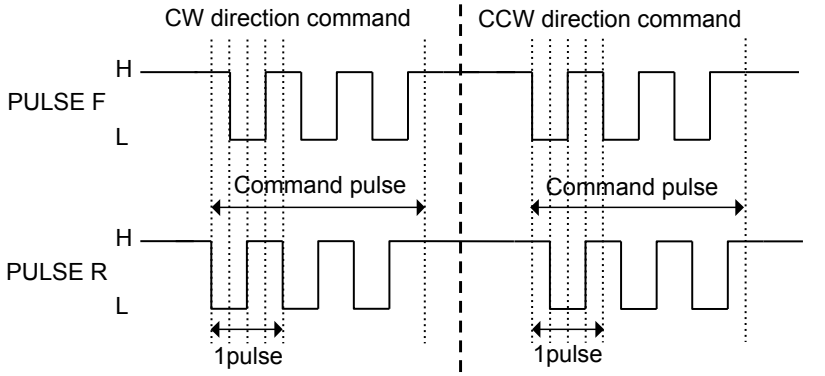
7.3.9 Style of command pulse

The command pulse formats of the various pulse polarity and pulse logic settings are listed below. For more information see Chapter 7.3.4, 7.3.5 and 7.3.6.

Command pulse method	Command pulse polarity	Command pulse logic	Details
1PULSE METHOD	CW	POSITIVE LOGIC	

Command pulse method	Command pulse polarity	Command pulse logic	Details
		NEGATIVE LOGIC	
	CCW	POSITIVE LOGIC	
		NEGATIVE LOGIC	
2PULSE METHOD	CW	POSITIVE LOGIC	

Command pulse method	Command pulse polarity	Command pulse logic	Details
		NEGATIVE LOGIC	
	CCW	POSITIVE LOGIC	
		NEGATIVE LOGIC	
2PHASE PULSE METHOD	CW	POSITIVE LOGIC	

Command pulse method	Command pulse polarity	Command pulse logic	Details
		NEGATIVE LOGIC	
	CCW	POSITIVE LOGIC	
		NEGATIVE LOGIC	

CW = clockwise

CCW = counterclockwise

H = High

L = Low

7.4 Input effective state (INPUT ENABLED STATE)

The effective state of the input signal for alarm, OPEN side limit, CLOSE side limit, original point sensor and ready can be selected.

The function becomes effective by shorting COM 3 and each signal when the input is effective and [SHORT] is selected.

When COM 3 and each signal are opened and [OPEN] is selected, the function becomes effective, refer to Chapter 10.4 for the details of servo controller interface signal.

7.4.1 Switch to screen of input effective state

Switch from weighing screen to the screen of input effective state by the following operation.

1. Select [MENU].
2. Select [SERVO CALIBRATION] at menu screen 1/2.
3. Select [INPUT ENABLED STATE] in servo calibration screen.

7.4.2 Alarm signal (ALARM SIGNAL)

The input effective state of the alarm signal output from the servo amplifier is set. [SV.ERR ALM] lights when the alarm signal becomes effective.

Alarm signal is selectable from [SHORT] or [OPEN].

[SHORT] is set as default.

1. Select [ALARM SIGNAL] in the screen of input effective state.
2. Select the input effective state of alarm signal.
3. Tap [OK].

7.4.3 Open side limit signal (OPEN LIMIT SENSOR)

When the limit sensor is used for opening / closing the gate, the input effective state of OPEN side limit signal is set. When the OPEN side limit signal becomes effective, [SV.ERR +LMT] lights and the gate stops.

The OPEN side limit signal is selectable from [SHORT], [OPEN] or [OFF].

[SHORT] is set as default.

1. Select [OPEN LIMIT SENSOR] in the screen of input effective state.
2. Select the input effective state of OPEN side limit signal.
3. Tap [OK].

Note:

The OPEN side limit signal and CLOSE side must use both by the pair. Either alone cannot be used. Select both the OPEN side limit signal and the CLOSE side turning off when not using this function.

7.4.4 Close side limit signal (CLOSE LIMIT SENSOR)

When the limit sensor is used for opening / closing the gate, the input effective state of CLOSE side limit signal is set. When the OPEN side limit signal becomes effective, [SV.ERR -LMT] lights and the gate stops.

The limit signal of side is selectable from [SHORT], [OPEN] or [OFF].

[SHORT] is selected as default.

1. Select [CLOSE LIMIT SENSOR] in the screen of input effective state.
2. Select the input effective state of CLOSE side limit signal.
3. Tap [OK].

Note:

The OPEN side limit signal and CLOSE side must use both by the pair. Either alone cannot be used. Select both the OPEN side limit signal and the CLOSE side turning off when not using this function.

7.4.5 Original point sensor signal (ORIGIN SENSOR)

When the original point sensor is used for the original point position detection at the gate, an input signal effective state of original point sensor is set.

The signal of original point sensor is selectable from [SHORT], [OPEN] or [OFF].

The default has selected as [SHORT].

1. Select [ORIGIN SENSOR] in the screen of input effective state.
2. Select the input effective state of the signal of original point sensor.
3. Tap [OK].

7.4.6 Ready signal (READY FOR OPERATION)

An input effective state of ready signal output from the servo amplifier is set. [SV.ERR RD] lights when the ready signal becomes ineffective condition.

Ready signal is selectable from [SHORT] or [OPEN].

The default has set as [SHORT].

1. Select [READY FOR OPERATION] in the screen of input effective state.
2. Select the level of the ready signal from [SHORT] or [OPEN].
3. Tap [OK].

⚠ CAUTION

Warning of personal injury and damage to property.

The limit signal for OPEN side, the limit signal for CLOSE side and the original point sensor signal are turned off.

▶ Make sure to use a protection device for the servomotor operation in the system.

7.5 Calibration of manual speed (MANUAL SPEED CALIB.)

The speed calibration when the gate is operated in manual is executed.

⚠ CAUTION

Damage to the system or malfunctions are possible.

▶ Set each parameter after confirming the specification of this unit and the servo amplifier and the servo motor used enough.

Note:

- Confirm the setting (refer to Chapter 7.3.5) before moving the gate by manual operation.

  According to the set value, there is a possibility of movement different from the direction that the gate intended.

- The command pulse value (output) is displayed in the display part of [INTERNAL COUNTER].

  The encoder pulse value (input) of 4 multiplications is displayed in the display part of [EXTERNAL COUNTER].

7.5.1 Switch to calibration screen of manual speed

Proceed as follows to switch from the weighing screen to the manual speed calibration screen.

1. Select [MENU].
2. Select [MANUAL SPEED CALIB.] in the screen of menu screen 1/2.
3. Select [MANUAL SPEED CALIB.] in servo calibration screen.

7.5.2 Low speed Calibration (LOW SPEED CALIB.)

Execute the calibration of a low speed in manual operation. A low speed calibration in manual operation is used for fine adjustment when the calibration of the gate position is executed. Calibrate at the speed of a possible locating.

The calibration range is 0.001 min^{-1} to calibration value at high speed.

0.01 min^{-1} is set as default.

1. Select [LOW SPEED CALIB.] in the screen of manual speed calibration.
2. Select [LOW SPEED] at low speed calibration screen.
3. Input rotation value (min^{-1}) of the servo motor in low speed movement with ten key.
4. Tap [OK].
5. Tap [OPEN] or [CLOSE], and confirm the speed of the gate in the movement of gate OPEN or gate CLOSE.
6. Tap [OK].

Note:

Confirm the setting (refer to Chapter 7.3.5) before moving the gate by manual operation. According to the set value, there is a possibility of movement different from the direction that the gate intended.

7.5.3 High speed calibration (HIGH SPEED CALIB.)

Execute the calibration of a high speed in manual operation.

A high speed calibration in manual operation is used for coarse adjustment when the calibration of the gate position is executed.

The calibration range is 0.001 min^{-1} to rated motor rotation value [min^{-1}].

20.000 min^{-1} is set as default.

1. Select [HIGH SPEED CALIB.] in the screen of manual speed calibration.
2. Select [HIGH SPEED] at high speed calibration screen.
3. Input rotation value (min^{-1}) of the servo motor in high speed movement with ten key.
4. Tap [OK].
5. Tap [OPEN] or [CLOSE], and confirm the speed of the gate in the movement of gate OPEN or gate CLOSE.
6. Tap [OK].

Note:

- Confirm the setting (refer to Chapter 7.3.5) before moving the gate by manual operation. According to the set value, there is a possibility of movement different from the direction that the gate intended.
- Calibrate at the speed that can be operated by the manual operation.

7.6 Positional calibration (POSITION CALIB.)

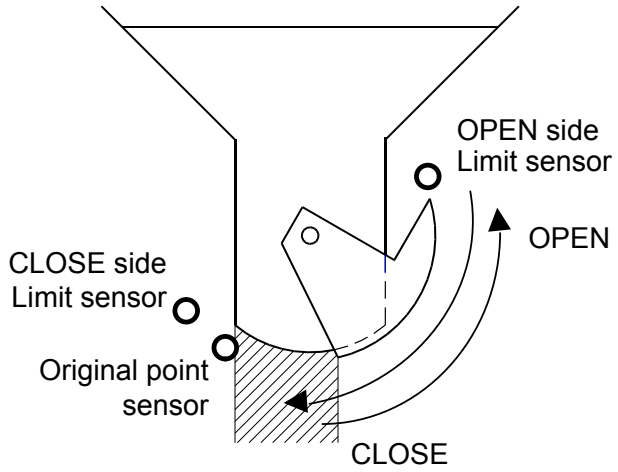
A positional calibration is executed after selecting each calibration method of original point positional calibration from TYPE1, TYPE2 or TYPE3, and full open positional calibration from TYPE1 or TYPE2 respectively.

Calibration method of original point

Type	Original point sensor	Limit sensor for OPEN side and CLOSE side	Remarks
TYPE1	–	–	Gate is moved by manual operation. Original point position is confirmed by sight. The original point position is set.
TYPE2	○	–	Gate is moved by manual operation. Original point position is detected by original point sensor. The original point position is set.
TYPE3	○	○	When the operator selects [START], the gate moves by automatic operation. Original point position is detected by original point sensor. The original point position is set.

Calibration method of full open position

Type	Remarks
TYPE1	Gate is moved by manual operation. Full open point position is confirmed by sight. The full open point position is set.
TYPE2	The full open point position is set by inputting the servo motor rotation value or input pulse.



⚠ CAUTION

Damage to the system or malfunctions are possible.

- ▶ Set each parameter after confirming the specification of this unit and the servo amplifier and the servo motor used enough.

Note:

- Start weighing after returning the gate to the original point.

  When the weighing signal of gate is input excluding the original point position, the screen shows [SQ.ERR11].

- Refer to Chapter 4.4 and 10.4 for original point sensor and limit sensor of OPEN side / CLOSE side.

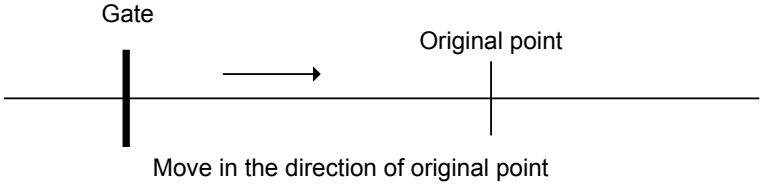
7.6.1 Switch to position calibration screen

You can switch from measurement screen to calibration screen of position by the following operation.

1. Select [MENU].
2. Select [SERVO CALIBRATION] at menu screen 1/2.
3. Select [POSITION CALIB] at servo calibration screen.

7.6.2 Original point calibration TYPE1 (ORIGIN TYPE1)

The operator moves the gate manually, and confirms that the gate comes to the position of full open at sight. That position is calibrated as an original point position.

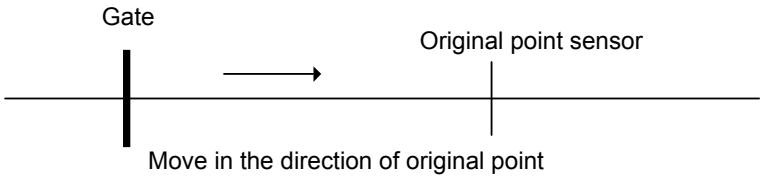


1. Select [ORIGIN TYPE1] in the screen of position calibration.

2. Select [MANUAL SPEED] in the screen of original point calibration TYPE1.
3. After selecting the speed in manual operation from [LOW SPEED] or [HIGH SPEED], tap [OK].
4. After selecting from [OPEN] or [CLOSE] in the screen of original point calibration TYPE1, stop the gate at original point position at sight.
5. Tap [OK].

7.6.3 Original point calibration TYPE2 (ORIGIN TYPE 2)

This is the original point calibration method when only the original point sensor is used. The gate is moved by the manual operation, and the original point position is calibrated based on information from the original point sensor.



1. Select [ORIGIN TYPE2] in the screen of position calibration.
2. Select [MANUAL SPEED] in the screen of original point calibration TYPE2.
3. After selecting the speed in manual operation from [LOW SPEED] or [HIGH SPEED], tap [OK].
4. After selecting from [OPEN] or [CLOSE] in the screen of original point calibration TYPE2, stop the gate at original point position at sight.
5. Tap [OK].

⚠ CAUTION

Warning of personal injury and damage to property.

There is a possibility that the gate is overrun according to the calibration value or the system composition.

▶ Execute calibration of manual speed, refer to Chapter 7.5.

Note:

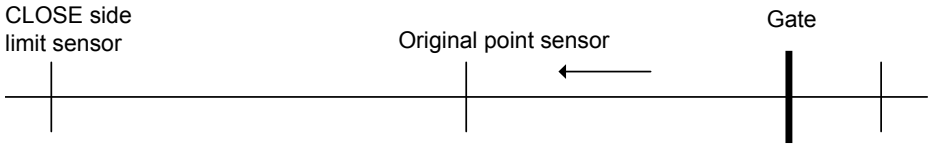
Please mount the original point sensor on an appropriate position. When the position of the original point sensor is improper, the original point cannot be correctly detected.

7.6.4 Original point calibration TYPE3 (ORIGIN TYPE 3)

This is an original point calibration method when both an original point sensor and a limit sensor are used. The limit sensor is necessary for two places of OPEN side direction and CLOSE side direction.

1. Select [ORIGIN TYPE3] in the screen of position calibration.

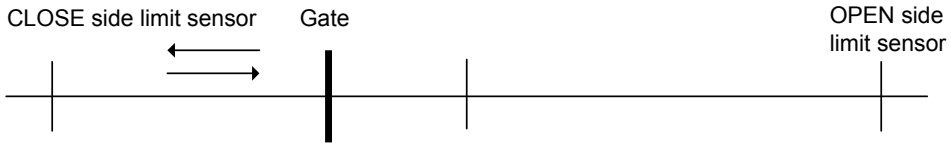
   When the gate is in the direction of OPEN side.
2. Tap [START].



▷ The gate moves in the direction of CLOSE side.

When the gate is in the direction of CLOSE side.

3. Tap [START].



▷ The gate moves in the direction of CLOSE.

After the CLOSE side limit sensor is detected, it moves in the direction of OPEN.

When [STOP] is tapped, the gate stops.

4. Tap [OK].

⚠ CAUTION

Warning of personal injury and damage to property.

There is a possibility that the gate is overrun according to the calibration value or the system composition.

▶ Execute calibration of manual speed, refer to Chapter 7.5.

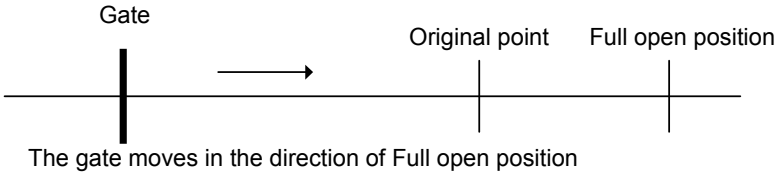
Note:

Mount the original point sensor on an appropriate position. When the position of the original point sensor is improper, the original point cannot be correctly detected.

7.6.5 Full open position calibration TYPE1 (FULL OPEN TYPE 1)

The operator moves the gate manually, and confirms that the gate comes to the position of full open at sight.

That position is calibrated as a full open position.



1. Select [FULL OPEN TYPE1] in the screen of position calibration.
2. Select [MANUAL SPEED] in the screen of full open position calibration TYPE1.
3. After selecting the speed in manual operation from [LOW SPEED] or [HIGH SPEED], tap [OK].
4. After selecting from [OPEN] or [CLOSE] in the screen of full open position calibration TYPE1, stop the gate at full open position at sight.

5. Tap [OK].

7.6.6 Full open position calibration TYPE2 (FULL OPEN TYPE 2)

The rotating speed or the input pulse of the servo motor necessary for gate full open is registered, and the full open position is calibrated.

If either is set, the set value is reflected in other setting.

1. Select [FULL OPEN TYPE2] in the screen of position calibration.

   Registration of the rotating speed of servo motor

   Setting range is 0.250 to 1 000.000 rev.

   0.250 rev is set as default.

2. Select [MOTOR REV.], and input the rotating speed of servo motor necessary for gate full open with ten key.
3. Tap [OK].

   Registration of input pulse

   The setting range is from (Input pulse value per 1 rotation x 0.250) to (input pulse value per 1 rotation x 1000) pulse.

   32 768 pulse is set as default.

4. Tap [INPUT PULSE], and input the input pulse necessary for the gate full open with ten keys.
5. Tap [OK].

7.7 Manual operation (MANUAL CONTROL)

The manual operation of gate is executed. The manual operation can be used when the system is maintained and confirmed the movement of the gate. The manual operation screen can be switched by selecting the manual mode on the measurement screen and shortening the input according to Chapter 10.3.

⚠ CAUTION

Damage to the system or malfunctions are possible.

▶ Set each parameter after confirming the specification of this unit and servo amplifier and the servo motor used enough.

7.7.1 Switch of manual operation screen

You can switch from weighing screen to position calibration screen by the following operation.

1. Select [MENU].
2. Select [SERVO CALIBRATION] in menu screen 1/2.
3. Select [MANUAL CONTROL] in servo calibration screen.

7.7.2 Movement of manual operation

Note:

- The command pulse value (output) is displayed in the display part of [INTERNAL COUNTER].
- The encoder pulse value (input) of 4 multiplications is displayed in the display part of [EXTERNAL COUNTER].

1	[MANUAL SPEED] The speed in manual operation is set. It is selectable from [LOW SPEED] or [HIGH SPEED].
2	[OPEN] The gate moves in the direction of OPEN while tapping [OPEN]. The gate stops when you stop tapping.
3	[CLOSE] The gate moves in the direction of CLOSE while tapping [CLOSE]. The gate stops when you stop tapping.
4	[FULL OPEN] The gate moves to full open position that is registered (refer to Chapter 7.6).
5	[RETURN] The gate moves to original point position that is registered (refer to Chapter 7.6).
6	[STOP] The gate stops moving.

Note:

- Please confirm the setting (refer to Chapter 7.3.5 before moving the gate by manual operation. According to the set value, there is a possibility of movement different from the direction that the gate intended.
- The switch to manual operational screen is not possible while weighing.
- Don't select either [FULL OPEN] or [RETURN] without executing the position calibration.
- [MANUAL MODE] (refer to Chapter 10.3) becomes effective only in the weighing screen.
- The movement of a gate stops when you execute to switch to weighing screen while the operation in manual.

7.8 Software limit (SOFTWARE LIMIT)

The limit position of a gate movement on the OPEN side and CLOSE side can be arbitrarily set with software based on the set value (refer to Chapter 7.6). The gate stops when the value set to the gate is exceeded.

The software limit can set the limit position to OPEN side and CLOSE side as taking the place of limit sensor. Moreover, using the limit sensor together with the software limit becomes a double security precaution.

7.8.1 Switch to software limit screen

You can switch from weighing screen to software limit screen by the following operation.

1. Select [MENU].
2. Select [SERVO CALIBRATION] in menu screen 1/2.
3. Select [SOFTWARE LIMIT] in servo calibration screen.

7.8.2 Open side software limit

The limit position in the direction of OPEN side can be set.

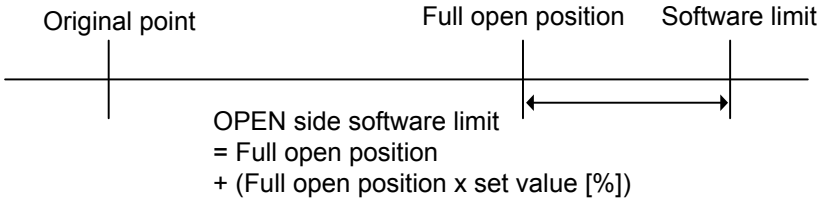
The gate stops when the gate exceeds the limit position set already.

The software limit of OPEN side is selectable from [EFFECTIVE] or [INVALID]

The setting range of OPEN side software limit is 1.000 % to 100.000 %.

[INVALID] is set as default.

OPEN side software limit = Full open position + (Full open position x set value [%])



1. Tap [OPEN ACTION] in software limit screen, and select from [EFFECTIVE] or [INVALID].
2. Tap [OK].
3. Select [OPEN SOFT LIMIT], and input OPEN side software limit value with ten keys.
4. Tap [OK].

⚠ CAUTION

Warning of personal injury and damage to property.

There is a possibility that the gate is overrun according to the system composition even if the stop by the software limit is set.

▶ Set the value for the OPEN side again.

7.8.3 Close side software limit

The limit position in the direction of CLOSE side can be set.

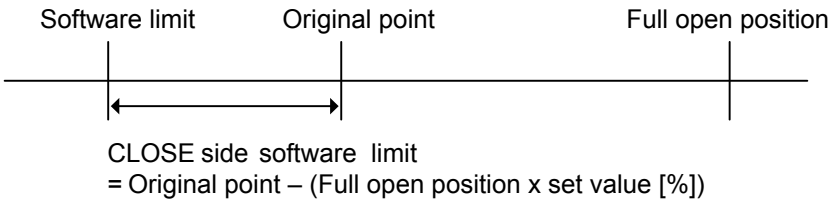
The gate stops when the gate exceeds the limit position set already.

The software limit of CLOSE side is selectable from [EFFECTIVE] or [INVALID]

The setting range of CLOSE side software limit is 1.000 % to 100.000 %.

[INVALID] is selected as default.

CLOSE side software limit = Original point – (Full open position x set value [%])



1. Tap [CLOSE ACTION] in software limit screen, and select from [EFFECTIVE] or [INVALID].
2. Tap [OK].
3. Select [CLOSE SOFT LIMIT], and input CLOSE side software limit value with ten keys.
4. Tap [OK].

⚠ CAUTION

Warning of personal injury and damage to property.

There is a possibility that the gate is overrun according to the system composition even if the stop by the software limit is set.

▶ Set the value for the CLOSE side again.

7.8.4 Deviation software limit

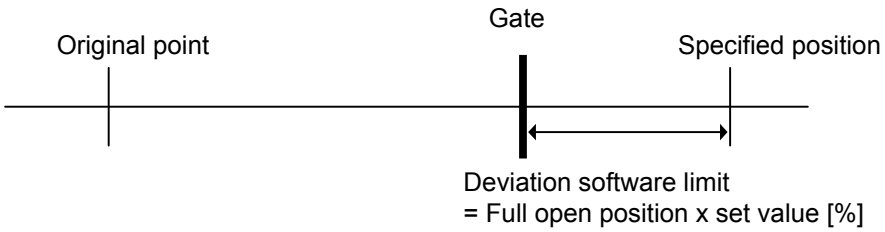
The limit position can be set by using the deviation between the value of input pulse and output pulse.

The gate stops when the gate exceeds the limit position set already.

The deviation software limit is selectable from [EFFECTIVE] or [INVALID]

The setting range of deviation software limit is 1.000 % to 100.000 %.

[INVALID] is set as default.



1. Tap [DEVIATION ACTION] in software limit screen, and select from [EFFECTIVE] or [INVALID].
2. Tap [OK].
3. Select [DEVIATION SOFT LIMIT], and input deviation software limit value with ten keys.
4. Tap [OK].

⚠ CAUTION

Warning of personal injury and damage to property.

There is a possibility that the gate is overrun according to the system composition even if the stop by the software limit is set.

▶ Set the value for the deviation again.

8 Graphical display function (GRAPHIC DISPLAY)

This is the function to display the graph as for the change of the weighing value in the optional time set.

Set the drawing mode referring to Chapter 9.17 and 9.18.

8.1 Changeover to the graphical display screen

Change from the weighing screen to the graphical display screen by the following operation.

1. Select [MENU].
2. Select [GRAPHIC DISPLAY] in the menu screen 1/2.

8.2 Graphical drawing

Horizontal axis

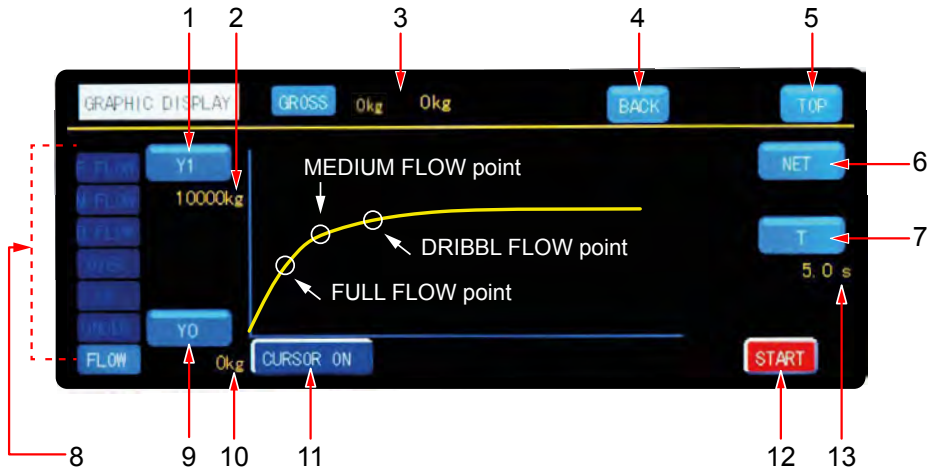
- The horizontal axis is set as the time axis.
- The weighing from the time of inputting the start signal to the setting time with [T] is drawn as one screen.

Vertical axis

- The vertical axis is set as the display axis.
- The weighing from the value set by [Y0] to the value set by [Y1] is drawn as one screen.

8.3 Graphical display

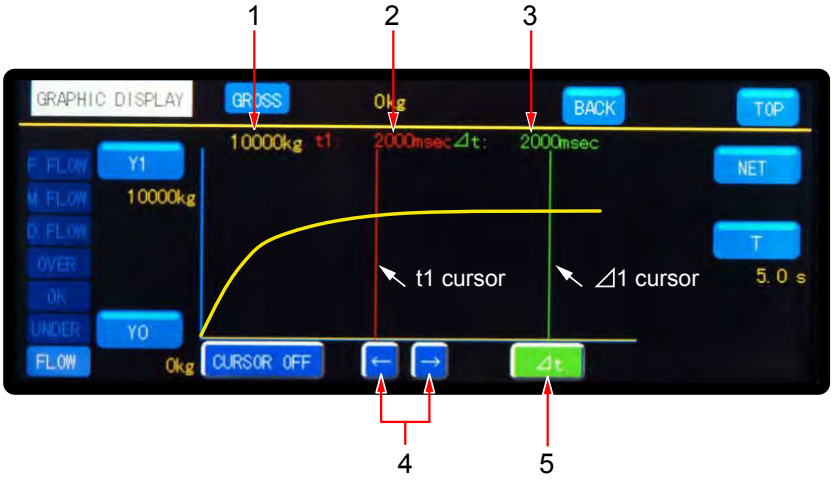
< At cursor OFF >



1 Y1 setting
This is the button that sets the upper limit value of the weighing value for the graphical display.
By tapping this, the screen switches to ten keys screen, so input the optional value.
The input range is from -999 998 to 999 999, but when the input value is less than Y0, [Y0 value + 1] is set automatically.

2	Y1 value display It displays Y1 value set at present.
3	Gross value / Net value display This displays whether the displayed weighing amount is gross weight or net weight.
4	[BACK] You can return to the previous screen.
5	[TOP] You can return to main screen.
6	Switch of the display in gross weight or net weight This is used for switching the load displayed to gross weight or net weight. [NET] is displayed when a present load display is gross weight, and [GROSS] is displayed when a present load display is net weight.
7	Weighing time setting This sets the weighing time that displays graph. The input range is from 1.0 to 99.9 seconds.
8	Status of display This displays the finishing condition of each output signal in weighing operation. The display lights when each function operates normally.
9	Y0 setting This is the button that sets the lower limit of the weighing value for the graphical display. By tapping this, the screen switches to ten keys screen, so input the optional value. The input range is from -999 999 to 999, but when the input value is over the value of Y1, [Y1 value – 1] is set automatically.
10	Y0 value display It displays Y0 value set at present.
11	Cursor ON/OFF switch This turns on and off the cursor in the display of graph after the finish of weighing.
12	Switch of Start / Stop This is a switch for start and stop of the weighing which displays by graphical screen. When the cursor is turning on, it does not display.
13	Display of weighing time This displays the weighing time set at present.

< At cursor ON >



1	Weighing amount at cursor The weighing amount at cursor position is displayed. When the ⊿t cursor turns off, the load value at the position of t1 cursor is displayed, and when the ⊿t cursor turns on, the weighing amount at the position of ⊿t cursor is displayed.
2	t1 display The time from the starting point of weighing to the t1 cursor is displayed.
3	⊿t display The time from t1 cursor to ⊿t cursor is displayed.
4	Cursor moving button This button is used to move the cursor. When you keep tapping longer than the fixed time, the cursor is moving with higher speed than the normal. When the ⊿t cursor turns off, t1 cursor is the moving target, and when the ⊿t cursor turns on the ⊿t cursor is the moving target.
5	Switch of ⊿t display Turn on and off the ⊿t cursor. When the ⊿t cursor turns off, t1 is the target of weighing amount, and when ⊿t cursor turns on, ⊿t is the target of the movement or the target of weight display value.

9 Basic function setting display (BASIC FUNCTION)

The following each function can be set from the basic function setting screen.

9.1 Switch to the basic function setting screen

You can switch from weighing screen to basic function setting screen by the following operations.

1. Select [MENU].
2. Select [BASIC FUNCTION] in the menu screen 1/2.

9.2 Display rate (DISP.REFRESH RATE)

The display rate is selectable from [4 times/s] or [20 times/s].

[4 times/s] is selected as default.

9.3 A/D sampling rate (A/D SAMPLING RATE)

The A/D sampling rate is selectable from [10 times/s], [20 times/s], [50 times/s], [100 times/s] or [200 times/s].

[200 times/s] is selected as default.

9.4 Analog filter (ANALOG FILTER)

The analog filter function reduces the noise of the input signal by filtering.

This frequency is selectable from [2 Hz], [4 Hz], [6 Hz], [8 Hz], [10 Hz] or [100 Hz].

[4 Hz] is selected as default.

9.5 Digital filter (DIGITAL FILTER)

The digital filter is the function to stabilize the data which A/D is converted by the moving average process. The moving average frequency can be set.

This is input with ten keys in the range from 1 to 256 in one time interval.

16 is set as default.

The tendency of the characteristic by the moving average is shown in the table below.

Moving average rate	Few		Many
Noise resistance	Sharp	⟷	STABLE
Response speed	Fast	⟷	Slow

9.6 Stabilization filter

The stabilization filter adjust the digital filter strong by the moving average process for the stabilization filter to the data after executing the process (described in Chapter 9.5) when the change width of the load display is within the constant value and at the same status continues longer than the fixed time.

The function is more stable when the load change is small and possible to measure following to the load change response when it is large, because the moving average process for stabilization filter is executed only the range meets the operating condition

comparing with digital filter (refer to Chapter 9.5) executed the moving average filter all times.

9.6.1 Setting of stabilization filter (STABILIZATION FILTER)

The moving average frequency for the stabilization filter is set.

Setting is input with ten keys in the range from 1 to 256 in every 1 time.

40 is set as default.

9.6.2 Coefficient of data width for stabilization filter (STAB.FILTER BAND)

In order to operate function of Stabilization filter, the coefficient of the data width for stabilization filter per scale interval (minimum scale divition) is set. The measuring the time width of Stabilization filter is started after the detection that change width of the load display is within the range of data by this setting.

The setting is input with ten keys in the range from 0.0 to 99.9 in every 0.1 d.

The coefficient turns off when the setting is [0.0]. [2.0] is set as default.

Example:

Stabilization filter data width per the setting value [n] is calculated in the display conversion as follows:

Stabilization filter data width = Coefficient of Stabilization filter data width (n) x Scale interval (Division)

When the setting of coefficient of stabilization filter data width is [2.0] and the Division is [D = 1]:

Stabilization filter data width = 2.0 x 1 d = 2.0 d

9.6.3 Time width of stabilization filters (STAB.FILTER TIME)

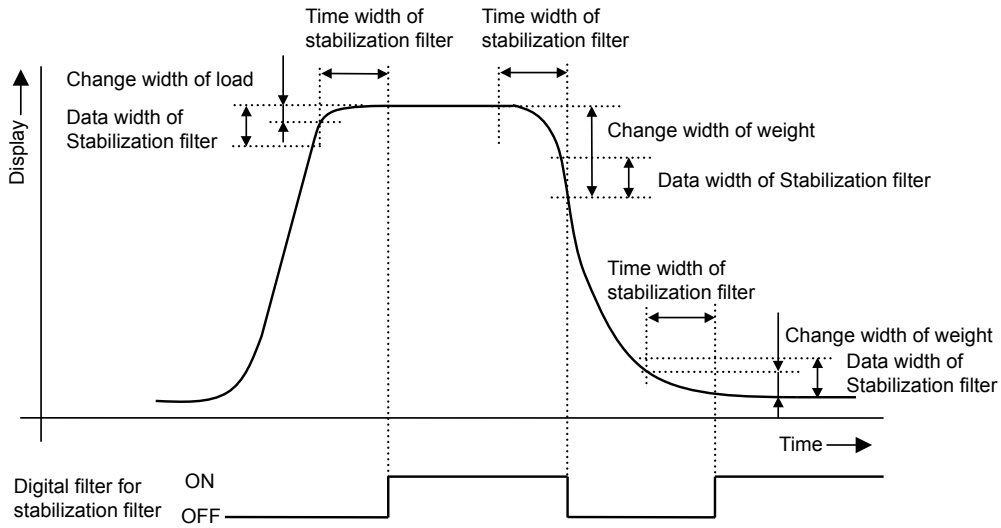
In order to operate the function of stabilization filter, the time width of stabilization filter is set.

A time which is measured just after the change width of the load display becomes within the effective range is judged whether it is within the time width set this time or not.

Setting is input with ten keys in the range from [0.0] to [9.9] in every [0.1] seconds.

The time width turns off when the setting is [0.0]. [0.5] is set as default.

Therefore, the set stabilization filter (refer to Chapter 9.6.1) becomes effective and the moving average processes when the change width of weight display is within the value calculated by the stabilization filter data width and at the same time the status continues more than the set time (refer to Chapter 9.6.2 und 9.6.3).



Note:

When the moving average frequency of digital filter is set (refer to Chapter 9.5), the moving average of stabilization filter is executed after the moving average of digital filter.

9.7 Stability detection

The stability detection is the function to judge that the weight value is stable when the change width of display is within the stability detection data width, and at the same time the status continues longer than the stability detection time width set before.

A result of stability detection can be displayed in the status display part on the weighing screen, and confirmed by the external control I/O (open collector output), 2-pin method serial interface, Standard RS-485 interface, optional BCD output (open collector output) or optional RS232C/RS422/RS485 interface.

9.7.1 Coefficient of stability detection width (STAB. DETECTION BAND)

The coefficient of the stability detection width is set in order to set the operative condition of stability detection.

The measuring the time width of stability detection is started after detecting the change width of the weight display within the range of data by this setting.

The set value is input with ten keys in the range from 0.0 to 99.9 in every 0.1 d.

The coefficient turns off when the setting is [0.0].

[2.0] is set as default.

Example:

The data width of stability detection per setting value [n] is calcurated in the display conversion as follows:

Stability detection data width = Coefficient of stability detection width (n) x Scale interval (Division)

When the setting of the coefficient of stability detection width is [4.0], and the division is [D = 2].

Stability detection data width = 4.0 x 2 = 8.0 d

9.7.2 Stability detection time (STAB. DETECTION TIME)

The time width of stability detection is set in order to set the operative condition of Stability detection.

A time is measured just after the change width of the load display becomes within the effective range, and this funciton judges whether the time width is within the range or not set before.

The set value is input with ten keys in the range from 0.0 to 9.9 in every 0.1 seconds.

The stability detection turns off when the setting is [0.0].

[1.0] is set as default.

9.7.3 Operational condition of detecting stability (OPERATION OF STABILITY)

This unit is always detecting the stability in each setting screen.

The operational condition of stability detection is selectable from [ANYTIME] or [WEIGHING SCREEN ONLY]. [ANYTIME] is selected as default.

9.8 Zero set

The zero set function memorize the present weighing value as zero point and make the display to zero by tapping the [ZERO] when the display value at weight display part is the gross value, and at the same time the value is within the effective range of zero set.

9.8.1 Operative condition of zero set (OPERATION OF ZERO)

The operative condition of zero set is selectable from [IN STABLE MODE] or [ANYTIME].

The effective range is common for the zero set and the zero tracking.

[ANYTIME] is set as default.

9.8.2 Effective range of zero set (RANGE OF ZERO)

The effective range of zero set is set.

The setting is input with ten keys in the range from 0 to 30 in every 1 % with the persentage of max. load (Max).

The zero set turns off when the setting is [0].

[5] is set as default.

Note:

- The error of [Z. ERR ZERO] displays when the zero set function is set out of the effective range, and zero set is not accepted.

  Tap [ERR. RESET] to cancel the error on top left comer of the screen.

- When the tare weight cancellation or the preset tare weight cancellation is set, please forward the zero set after the clear of them.

9.9 Zero tracking

The zero tracking function corrects the zero drift, and stabilizes the zero point when the change width of the load display is within the data width for zero tracking, and at the same time the condition continues longer than the time offset by zero tracking time.

9.9.1 Target of zero tracking (TARGET OF ZERO TRACKING)

The target of zero tracking can be selected from [GROSS / NET] or [GROSS].

[GROSS] is selected as default.

When [GROSS / NET] is selected, the weighing value both of gross and net become the target for zero tracking.

9.9.2 Coefficient of data width for zero tracking (ZERO TRACKING BAND)

The coefficient of data width for zero tracking is set in order to set the operative condition of zero tracking.

The setting is input with ten keys in the range from 0.0 to 9.9 in every 0.1 d.

When [0.0] is set, the zero tracking turns off.

[0.0] is set as default.

For example:

The data width for zero tracking with the coefficient of zero tracking data width is set.

The zero tracking data width per the setting value [n] is calculated in the display conversion as follows:

Zero tracking data width = Coefficient of zero tracking data width (n) x Scale interval (Division)

When the setting of coefficient of zero tracking data width is [5.0] and the divition is [D = 5]:

Zero tracking data width = 5.0 x 5 d = 25.0 d

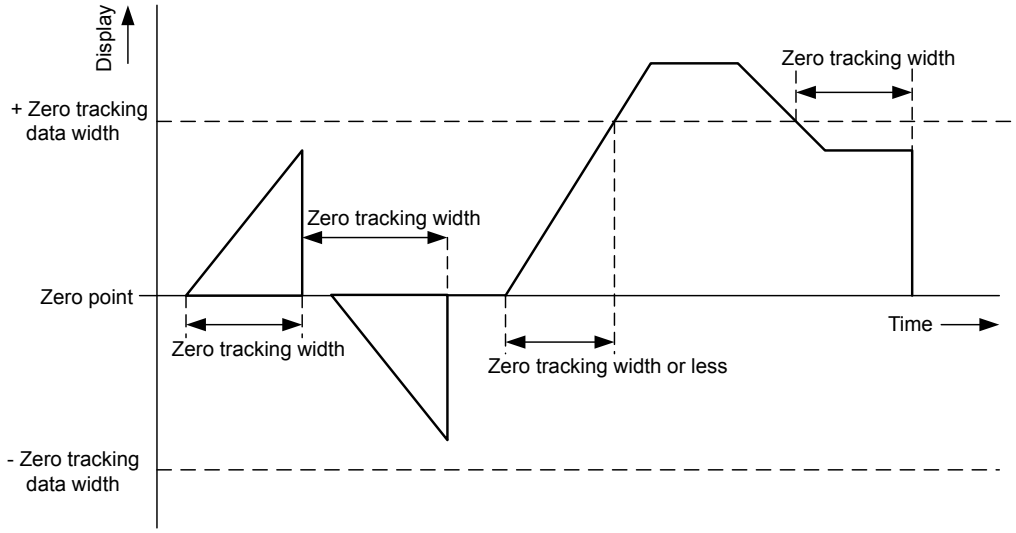
9.9.3 Time of zero tracking (ZERO TRACKING TIME)

The time of zero tracking is set in order to set the operative condition of zero tracking.

The setting is input with ten keys in the range from 0.0 to 9.9 in every 0.1 seconds.

When [0.0] is set, the zero tracking turns off.

[0.0] is set as default.



Note:

- The zero tracking does not work when the setting either of coefficient of the zero tracking data width or the zero tracking time is [0].
- Do not use the zero tracking when the weight vibrates gradually in near zero point.
- Note that zero tracking might become effective even if the actual load change is rapid when the weight change becomes gradually by the strength of the digital filter or the stabilization filter,
- The zero tracking does not accept when the zero for the effective portion is compensated by the zero tracking or the zero setting.

9.10 Tare weight cancellation

By selecting [TARE], the weight display value displays the net weight value. And at the same time, the sign of [GROSS] on status display-1 switches to [NET], the sign of [TARE] lights, and the display becomes zero.

Tap [TARE] when the gross value is zero to clear the tare weight cancellation.

The tare weight cancellation is cleared, and the display becomes gross amount display. At the same time, [NET] of status display-1 switches to [GROSS], and the sign of [TARE] turns off.

9.10.1 Operational condition of tare weight cancellation (OPERATION OF TARE)

The operational condition of tare weight cancellation is selectable from [IN STABLE MODE] or [ANYTIME].

[ANYTIME] is selected as default.

When [ANYTIME] is selected, the condition becomes that the tare weight cancellation is anytime acceptable.

And when [IN STABLE MODE] is selected, the tare weight cancellation is acceptable only when the sign of [STABLE] in status display-1 lights.

9.10.2 Operational range of tare weight cancellation (RANGE OF TARE)

The operational range of tare weight cancellation is selectable from [0 < GROSS ≦ MAX.WEIGHT] or [GROSS ≦ ?MAX.WEIGHT?]

[0 < GROSS ≦ MAX.WEIGHT] is selected as default.

Note:

The error of [Z.ERR A/Z] is displayed when the tare weight cancellation is executed out of range.

Tap [ERR. RESET] on top left corner in the screen to cancel the error.

9.11 Preset tare

This is a function to display the amount after subtracting the setting value from the gross weight value.

9.11.1 Operation of preset tare (OPERATION OF PRE.TARE)

The operation of the preset tare is selectable from [EFFECTIVE] or [INVALID].

[EFFECTIVE] is selected as default.

Note:

To execute the preset tare cancellation, please set the operation of the preset tare weight cancellation to [EFFECTIVE] and set the preset tare weight amount in each brand.

9.11.2 Read-out operation of preset tare as zero (PRESET TARE=0 CHOICE)

The operation for the amount of preset tare is selectable from [THE LAST TARE IS USED] or [OPERATION OF TARE CLR] in changing from the brand which set the preset tare to the brand which does not set the preset tare under the condition that the operation of preset tare weight cancellation is effective.

When [THE LAST TARE IS USED] is selected, the preset tare of the brand before the change is applied. [TARE CLR] is selected as default.

Note:

- When the tare weight cancellation is executed in the condition of the preset tare being effective, the preset tare is cancelled and the tare weight cancellation is executed.

  The tare weight cancellation cannot be used together with the preset tare.
- The tare is cleared if the zero set is executed in the condition of the gross weight display.

9.12 Power-on-zero

When the power is turned on, this function [Power on ZERO] calibrats the display to zero if the condition is stable, and the weight value is within ±10 % of the max. load (Max).

When the power is turned on, the function [Power ON ZERO] returns the compensation processed by zero set and zero tracking to the weight value before calibrating the compensation.

9.12.1 The operation of power–on-zero (ZERO AT POWER ON)

This function is selectable from [EFFECTIVE] or [INVALID].

[INVALID] is selected as default.

9.12.2 Clear of power–on-zero (ZERO CLR.POWER ON)

The operation of clear at power-on-zero is selectable from [EFFECTIVE] or [INVALID] [INVALID] is selected as default.

Note:

- Zero compensation may not be accepted when the setting of power-on-zero clear is [EFFECTIVE], and the condition at power-on is as follows;
  - When the weighing is not in the stable condition, the display becomes [-888 888].
  - When the weighing value exceeds over ±10 % of the weighing capacity, the display becomes [- --- ---].
- When the power-on-zero is applied, each data of tare weight cancellation, preset tare weight cancellation, zero set and zero tracking is cleared.

9.13 Power-on tare weight cancellation

When the power turns on, power-on-tare-weight-cancellation processes the tare weight cancellation.

When the power turns on, the power-on-tare-weight-cancellation-clear clears the tare weight and returns the display to the gross weight.

9.13.1 Operation of power-on-tare-weight-cancellation (TARE AT POWER ON)

The operation of power-on-tare-weight-cancellation is selectable from [EFFECTIVE] or [INVALID].

[INVALID] is selected as default.

9.13.2 Power-on-tare-weight-cancellation-clear (TARE CLR. AT POWER ON)

The operation of power-on-tare-weight-cancellation-clear is selectable from [EFFECTIVE] or [INVALID].

[INVALID] is selected as default.

9.14 Operation of hold (OPERATION OF HOLD)

The operational condition of hold is selectable from [SYNC.WITH HOLD] or [SYNC.WITH BATCH FINISH].

[SYNC.WITH HOLD] is selected as default.

Note:

Target of hold operation is applied in Chapter 9.19, 9.20 and 9.21.

9.15 Print command (PRINT COMMAND)

The print command is selectable from [IN STABLE MODE] or [ANYTIME] when the print command is input from the external I/O.

[IN STABLE MODE] is selected as default.

When [ANYTIME] is selected, the print command is always accepted.

And when [IN STABLE MODE] is selected, the print command is accepted only when [STABLE] sign of the status display-1 lights.

9.16 Accumulation

This function adds and accumulates the weighing data.

The brand accumulation function works when the accumulation command signal is input or the automatic accumulation function is applied.

9.16.1 Accumulation command (ACCUM. COMMAND)

The operational condition when the accumulation command is input from the external I/O is selectable from [IN STABLE MODE] or [ANYTIME].

[IN STABLE MODE] is selected as default.

When [ANYTIME] is selected, the accumuration command is always accepted.

When [IN STABLE MODE] is selected, the accumuration command is accepted only when [STABLE] sign of the status display-1 lights.

9.16.2 Automatic accumulation function

Set the followings for applying the automatic accumulation:

- The automatic accumulation function is switched to [SYNC. WITH FINISH] or [AUTO ACCUM. AT STABLE] in weighing operation setting screen.

  When [SYNC. WITH FINISH] is set, this funciton accumulates to synchronize with the finish signal of the weighing.

  When [AUTO ACCUM. AT STABLE] is set; this function accumulates to synchronize with stable signal of the weighing.

- Automatic accumulation condition is selectable from [IN OK MODE] or [NO CONDITION] in weighing operation setting screen of the above same screen.

  When [IN OK MODE] is set, the weighing data is accumulated if the [OK] sign in the status display-1 lights when the signal set in "Automatic accumulation function" is output.

  This accumulation does not proceed if [OK] sign does not light.

  When [NO CONDITION] is set, the weighing data is accumulated unconditionally when the signal set in "Automatic accumulation function" is output.

9.16.3 Accumulation clear

Clear the accumulated value and the accumulation times of each brand on brand code screen of by external control I/O (refer to Chapter 10).

The range of Accumulation value is from –99 999 999 to 99 999 999.

The range of the accumulation times is from 0 to 999 999.

When the accumulation exceeds these ranges, the indicated amount of the accumulation value and the accumulation times become red.

In such case, clear the accumulation value or accumulation times.

9.17 Graph trigger mode (GRAPHIC TRIGGER SETTING)

The trigger mode to draw in the graph is set.

[SINGLE]	By tapping [START], the weighing starts and graph draws once until the time of [T].

[START + LEVEL↑]	By tapping [START], the detection of level is started. Graph starts drawing when the weight value exceeds the set value of [GRAPH TRIGGER LEVEL], and draws once until the time of [T].
[START + LEVEL↑↓]	By tapping [START], the level detection starts. Graph starts drawing when the weight value has passed the set value of [GRAPH TRIGGER LEVEL], and draws once until the time of [T].
[LEVEL↑]	By tapping [START] or when the weight value exceeds the set value of [GRAPH TRIGGER LEVEL], graph starts drawing and draws once until the time of [T].
[LEVEL↑↓]	By tapping [START] or when the weight value has passed the set value of [GRAPH TRIGGER LEVEL], graph starts drawing and draws once until the time of [T].
[BATCH START LINKED]	By tapping [START] or by inputting [BATCH START], graph starts drawing and draws once until the time of [T].
[SINGLE] is set as default.	

9.18 Graph trigger level setting (GRAPH TRIGGER LEVEL)

The level of graph trigger is set.

The setting is inputting with ten keys in the range from -999 999 to 999 999 in every 1.

[0] is set as default.

9.19 Hold of comparative result (COMPARATIVE RESULT HOLD)

Hold operation of the comparative result that synchronizes with hold signal (refer to Chapter 9.14) is selectable from [INVALID] or [EFFECTIVE].

[INVALID] is set as default.

The targets of the hold are the signals of [FULL FLOW] (Full flow), [MEDIUM FLOW] Middle flow, [DRIBBLE FLOW] (Fine flow), [OVER], [OK], [UNDER], [FULL] and [ZERO BAND] (Empty).

Note:

During the hold of comparative result, the status data of status display, signal output, standard RS485 interface, RS232C interface and RS422/485 interface corresponding to the hold target of comparative result is held also.

9.20 Hold of 2-pin method serial interface (S-I/F HOLD)

Hold operation of the 2-pin method serial interface (S-I/F) outputs data that synchronizes with hold signal (refer to Chapter 9.14) is selectable from [INVALID] or [EFFECTIVE].

[INVALID] is selected as default.

The holding target are [GROSS], [NET], [TARE VALUE], [GROSS STATUS], [NET STATUS], [TARE STATUS], [STABLE], [CENTER ZERO], and [PRESET TARE].

Note:

Even if [OL] or [OVF] error occurs when 2-pin method serial interface (S-I/F) holds operation, the data as a holding target retains the holding condition.

The error of [OL] or [OVF] can be detected by the [OVR] signal.

9.21 Hold of weight display value (LOAD DISPLAY VALUE HOLD)

Hold operation of the weight display value that synchronizes (refer to Chapter 9.14) is selectable from [INVALID] or [EFFECTIVE].

[EFFECTIVE] is set as default.

Note:

When the error of [OL] or [OVF] occurs at the time of weight display value holding operation, a weight display section switches to the error display of [OL] or [OVF].

10 I/O setting (I/O)

This function sets the buttons from F1 to F4 displayed on the weighing screen and the external control I/O.

10.1 Change to I/O screen

Please switch to I/O screen by the following procedure in weighing screen.

1. Select [MENU].
2. Select [I/O] in the menu screen 1/2.

10.2 Setting of the function from F1 to F4

The various input functions from F1 to F4 displayed in the weighing screen are set.

10.2.1 Setting method of functions from F1 to F4 keys

1. Please tap the button to set from F1 key function to F4 key function in I/O setting screen 1/6.
2. Select the button to set the function, and tap [OK].

After setting the function from F1 to F4, the display from F1 to F4 in the weighing screen switches to the setting name.

When F1 is set as [MIXING START] and F2 is set as [BATCH START], the screen shows as follows.

10.2.2 Function list from F1 key to F4 key

The table below shows the function list that can be set from F1 to F4.

Name	Contents
[OFF]	No setting
[PRINT]]	Print signal is input.
[ZERO CLEAR]	Return the display to the state before zero set and zero tracking when zero set and zero tracking is executed.
[TARE CLEAR]	Return the display to the state of tare weight cancellation when the tare weight cancellation is executed.
[BATCH START]	The signal of batch start is input.
[DISCHARGE START]	The signal of discharge start is input.
[MIXING START]	The signal of mixing start is input.
[PAUSE]	The weighing operation is stopped temporarily.
[RESTART]	The weighing operation under the temporary stop is restarted.
[FORCED BATCH FINISH]	The weighing operation is compulsorily finished.
[FORCED DISCH. FINISH]	The discharge operation is compulsorily finished.
[ACCUM. COMMAND]	The accumulation signal is input.

Name	Contents
[CANCEL THE ACCUM.]	The previous one accumulation data is cancelled.
[M.F.F. COMPENSATION]	The fall compensation is executed.
[ERROR RESET]	The error display is reset. The targeted errors are [ZERO ERROR] (refer to Chapter 19.2.2) und [SEQUENCE ERROR] (refer to Chapter 19.2.3).
[CLR ACM. OF BRAND]	The accumulation value and accumulation times of the brand reading out at present is cleared.
[CLR ACM. OF ALL BRAND]	The accumulation value and accumulation times of all brands is cleared.
[HOLD]	The hold signal is input (Switch of ON and OFF).

10.3 Setting of external control I/O

Set the external I/O control.

The I/O connecter is mounted at rear panel of the unit.

Each of below function list can be optionally set.

10.3.1 Setting method of the external control I/O

1. When the external control input is set, please select the function from I/O input 1 to 11 of I/O setting screen 2/6 and 3/6.
2. When the external control output is set, please select the function from I/O input 1 to 11 of I/O setting screen 4/6 and 5/6.
3. And when the external control output logic is set, please select the function from I/O output logic in I/O setting screen 5/6.
4. Select the function to set, and tap [OK].

10.3.2 Tables of external control input function

The function that can be set to the external control input is as follows.

Item	Contents
[OFF]	No setting
[GROSS / NET]	The display of Gross and Net is switched.
[ZERO]	Zero set is executed.
[ZERO CLEAR]	When zero set or the zero tracking is executed, the display is returned to the state before the zero set and zero tracking.
[TARE]	The tare weight cancellation is executed.
[TARE CLEAR]	When tare weight cancellation is executed, the display is returned to the state before the tare weight cancellation.
[BATCH START]	The signal to start batch is input.
[DISCHARGE START]	The signal to start discharge is input.
[MIXING START]	The signal to start mixing is input.

Item	Contents
[M.F.F. COMPENSATION]	The compensation of manual free fall is executed.
[TOTAL COMMAND]	The accumulation signal is input.
[FOMER ACM. DATA CLR.]	The one previous accumulation data is cancelled.
[BATCH / DISCHARGE]	The batch and the discharge of the weighing mode are switched.
[CODE NO. 1, 2, 4, 8, 10, 20, 40, 80]	The brand code to be executed is switched by the BCD input.
[PAUSE]	The weighing operation is stopped temporally.
[RESTART]	The weighing is restarted from the pause status.
[CLR. ACCUM OF BRAND]	The accumulation value and times of the brand which is read out at present is cleared.
[CLR. ACCUM. OF ALL BRAND]	The accumulation value and times for the all brand is cleared.
[SAFETY INPUT 1 ~ 8]	The safety confirmation signal is input.
[FORCED BATCH FINISH]	The weighing operation is finished compulsorily.
[FORCED DISCH. FINISH]	The discharge operation is finished compulsorily.
[MANUAL FULL FLOW]	The full flow signal is output during inputting.
[MANUAL MEDIUM FLOW]	The medium flow signal is output during inputting.
[MANUAL DRIBBLE FLOW]	The dribble flow signal is output during inputting.
[MANUAL DISCHARGE]	The discharge signal is output during inputting.
[MANUAL MIXING]	The mixing signal is output during inputting.
[ERROR RESET]	The error is reset.
[PRINT COMMAND]	The print signal is input.
[HOLD]	The holding signal is input.
[Manual mode]	The screen is switched to manual operation screen (refer to Chapter 7.7).

The following items become effective once at the pulse input of over 50 ms or more.

[GROSS/NET], [ZERO], [ZERO CLEAR], [TARE], [TARE CLEAR], [BATCH START], [DISCHARGE START], [MIXING START], [M.F.F.COMPENSATION], [TOTAL COMMAND], [CANCEL THE ACCUM.], [PAUSE], [RESTART], [CLR ACM. OF BRAND], [CLR ACM. OF ALL BRAND], [FORCED BATCH FINISH], [FORCED DISCH. FINISH], [ERROR RESET] and [PRINT COMMAND]

The following items are level input, and become effective by inputting the shortening of 50 ms or more.

[BATCH/DISCHARGE], [CODE NO.1, 2, 4, 8, 10, 20, 40, 80], [SAFETY INPUT 1 to 8], [MANUAL FULL FLOW], [MANUAL MEDIUM FLOW], [MANUAL DRIBBLE FLOW], [MANUAL DISCHARGE], [MANUAL MIXING], [HOLD] and [MANUAL MODE]

10.3.3 Tables of external control output data function

The functions which can be set to the external control output are as follows;

Items	Contents
[OFF]	No setting
[STABLE]	The signal is output during stable.
[ZERO BAND]	The (Empty) signal is output in zero band.
[FULL]	The signal is output in full.
[FULL FLOW]	The signal is output in executing the full flow.
[MEDIUM FLOW]	The signal is output in executing the middle flow.
[DRIBBLE FLOW]	The signal is output in executing the fine flow.
[OVER]	The signal is output in weighing value being over.
[OK]	The signal is output when the weight value is OK.
[UNDER]	The signal is output when the weight value is under set point.
[MIXING]	The signal is output in executing the MIXING.
[DISCHARGE (GATE OPEN)]	The signal is output in executing the discharge.
[BATCH FINISH]	The signal is output in finishing the batching.
[DISCHARGE FINISH]	The signal is output in the finish of discharge.
[MIXING FINISH]	The signal is output in the finish of mix.
[NOZZLE DOWN (IN-SERT)]	The signal is output when the nozzle is down.
[DURING MEASURE-MENT]	The signal is output in the weighing.
[WEIGHING SEQ. ERROR]	The signal is output when the sequence error is caused.
[ERROR]	The signal is output when the error is occurred. Refer to Chapter 19.2.1, 19.2.2, 19.2.3 und 19.3.
[CAP. EXCEEDED ERROR]	The signal is output when the OL condition is satisfied.
[DURING TARE]	The signal is output when the tare weight cancellation is exe-cuted.
[CENTER OF ZERO]	The signal is output in the condition of the center zero.
[GROSS DISPLAY]	The signal is output when the display is the gross value.
[NET DISPLAY]	The signal is output when the display is the net value.
[DURING HOLD]	The signal is output during the holding operation is made.
[SERVO ERROR]	The signal is output when the error is occurred. The targeted errors are [SV.ERR EMG], [SV.ERR ALM].

10.3.4 Function of External control output logic

Output logic of I/O output from 1 to 11 is selectable from [NEG.][(negative logic)] or [POS.] (positive logic).

Selection is switched by tapping [NEG.] or [POS.] in a touch panel from OUT1 to OUT11. [NEG.] is set as default.

10.4 Setting of servo control interface

1	PULSE F, PULSE R PULSE F and PULSE R output the command pulse train that controls the servo amplifier and the servo motor by the differential line driver type. Please use them after confirming the command pulse input form of the servo amplifier used. Refer to Chapter 7.3.7.
2	Encoder A-phase pulse and encoder B-phase pulse Encoder A-phase pulse and encoder B-phase pulse can connect encoder A-phase pulse and encoder B-phase pulse output from servo amplifier by differential line driver type.
3	Alarm signal Please connect the alarm signal output from servo amplifier for alarm signal of this unit. [SV.ERR ALM] lights when the alarm signal becomes effective. Refer to Chapter 7.4 for switching the input effective state. **Note:** [SV.ERR ALM] lights when neither the connection nor the setting is correct.
4	Emergency stop signal Please connect the switch of the b-contact for emergency stop signal. [SV.ERR EMG] lights when the emergency stop signal is effective and the emergency stop of the system with this unit becomes available. Refer to Chapter 4.4 when you do not use the emergency stop signal. **Note:** [SV.ERR EMG] lights when not correctly connected.
5	Ready signal Please connect the ready signal output from servo amplifier for ready signal of this unit. [SV.ERR RD] lights when the ready signal becomes invalid. Refer to Chapter 7.4 for switching the input effective state. **Note:** [SV.ERR RD] lights when neither the connection nor the setting is correct.

6	OPEN side limit signal Please connect the limit sensor of OPEN side for OPEN side limit signal. [SV.ERR +LMT] lights and the gate stops when the OPEN side limit signal becomes effective. Refer to Chapter 7.4 for switching the input effective state. **Note:** [SV.ERR +LIMIT] lights when neither the connection nor the setting is correct.
7	CLOSE side limit signal Please connect the limit sensor of CLOSE side for CLOSE side limit signal. [SV.ERR -LMT] lights and the gate stops when the CLOSE side limit signal becomes effective. Refer to Chapter 7.4 for switching the input effective state. [SV.ERR -LIMIT] lights when neither the connection nor the setting are correct. **Note:** [SV.ERR -LIMIT] lights when neither the connection nor the setting are correct.
8	Original point sensor signal Please connect the Original point sensor for Original point signal. You can calibrate the original point by using the original point sensor in Chapter 7.6. Refer to Chapter 7.4 for switching the input effective state.

10.5 Key lock

This is the function to limit the operation to prevent the malfunction with the various button displayed in the weighing screen.

10.5.1 Setting method of key lock

1. Tap the key which sets the key lock in I/O setting screen 6/6.
2. Select [EFFECTIVE] and tap [OK] when the key lock is set effective.
3. Select [INVALID], and tap [OK] when the key lock is set invalid.

10.5.2 Key lock function list

The keys which can be set the key lock are as follows.

- [ZERO KEYLOCK] (Target key: [ZERO])
- [GROSS/NET KEYLOCK] (Target key: [GROSS] / [NET])
- [TARE KEYLOCK] (Target key: [TARE])
- [BRAND CODE KEYLOCK] (Target key: [FINAL], [F.FLOW], [M.FLOW], [OVER], [UNDER], [D.FLOW])
- [F-KEYLOCK] (Target key: [F])
- [MENU KEYLOCK] (Target key: [MENU])
- [CALIBRATION KEYLOCK] (Target key: [CALIBRATION])
- [SERVO CALIBRATION KEYLOCK] (Target key: [SERVO CALIBRATION])

10.5.3 Temporary release method of menu key lock

When the menu key locking is set, a temporary release procedure is as follows;

▶ Tap the below slanted section for over three seconds.

▷ After sounding the reorganization buzzer, the menu becomes effective only for 3 seconds.

Note:

When you tap the key whose key lock is targeted, the buzzer sounds for two times.

10.6 Switch of the weighing screen (SELECTION OF SCREEN)

This is the function to switch the display of the weighing screen.

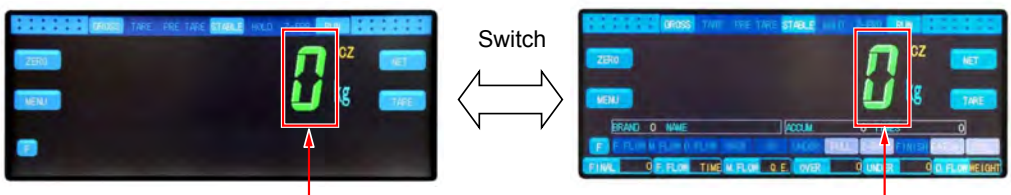
In SIMPLE display mode, all information boxed area in the below figure can set as non-display.

10.6.1 Weighing screen switching method

1. Select [MENU].
2. Select [BASIC FUNCTION] is on the menu screen 1/2.
3. Select [SELECTION OF SCREEN] is on the basic function setting screen 4/4.
4. Select [STANDARD], and tap [OK] when the screen is displayed by [STANDARD].
5. Select [STANDARD/SIMPLE], and tap [OK] when a screen is displayed by [SIMPLE].

10.6.2 Switch of STANDARD/SIMPLE

The weighing screen is switched as follows by setting to [STANDARD/SIMPLE].



The weighing screen is switched to STANDARD/SIMPLE by tapping boxed area on the upper figure for over three seconds.

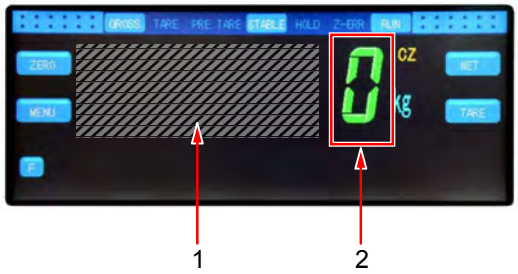
The switch of STANDARD display and SIMPLE display is locked when menu key lock function is effective, so refer to Chapter 10.5.3.

Note:

STANDARD/SIMPLE cannot be switched when [STANDARD] is selected.

10.6.3 Switching method of STANDARD/SIMPLE when the menu key lock is effective

STANDARD and SIMPLE is switched by the following method when the menu key lock is effective.



1. Tap the below slanted section for over 3 seconds. (Temporary release of menu key lock)
2. After sounding a reorganization buzzer, tap the boxed area on the upper figure for over 3 seconds.
   ▷ STANDARD and SIMPLE is switched (STANDARD and SIMPLE can be switched one round at a single temporary release.).

11 Weighing mode

11.1 Brand setting (BRAND CODE)

The comparison value and the brand name (product name) etc. per each brand (product) are set in the brand setting.

The weighing is controlled to become the target value of the weighing by the various setting value for the brand.

The maximum 100 kinds of brands can be registered in the instrument.

11.1.1 Switch to brand code screen

The screen is switched from weighing screen to brand code screen by the following operations.

1. Select [MENU].
2. Select [BRAND CODE] on menu screen 1/2.

11.1.2 Method of setting brand

1. The brand number (product number) is selected by touching [↑] and [↓]. Various set values are displayed along with the change of brand columns.
   ▷ The each item in brand number selected is set.
2. The selected brand is set as a valid brand by tapping [OK] to apply it to weighing operation.

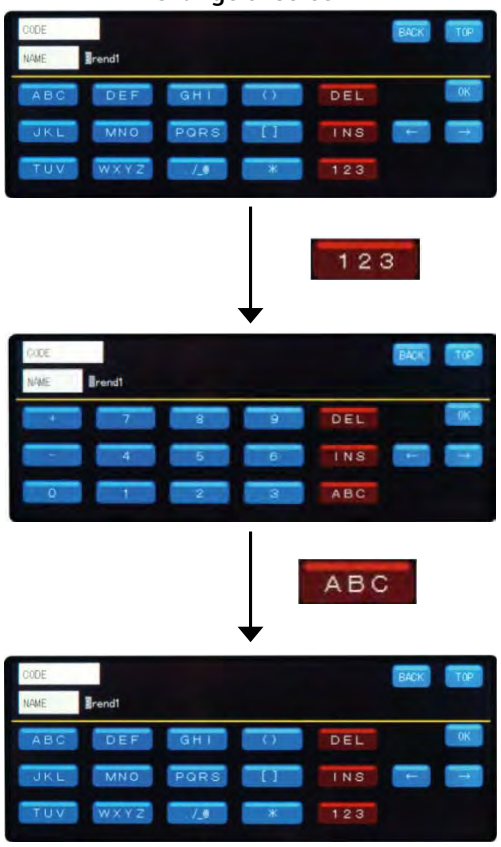
Note:

The brand setting cannot be changed during each mode weighing at the weighing mode.

11.1.3 Setting method of brand name (NAME)

1. Select [NAME].
2. The brand name (product name) is input with an optional key tapped.
3. After confirming the content of the input in the input confirmation display, then tap [OK].
4. The brand name input is ended, and switched to the brand code screen.

Change of screen



Input alphabet and symbol on the ABC input screen.
The alphabet and the symbol displayed in the key every time each key is tapped are sequentially displayed.
After it round with capital letters, it becomes an input of small letter.
< Example >
When the ABC key is tapped two or more times. It changes in order of
A→B→C→a→b→c→A

Figure is input on the figure input screen. Please input by tapping the optional key.

← and → are used when you need to move the cursor on the input confirmation display section.
The [DEL] is used when you want to delete the character on the cursor.
The [INS] is used to change the input to Overwrite/Insert.
Overwrite condition is selected as default, so tapping the [INS] makes the condition when the key is passed. Under such a condition, it enters the state of insertion.

By tapping [BACK], you can change the brand code screen, and when TOP is tapped, you can move to measurement screen.

11.1.4 Setting item of brand

The item of each brand number that can be set with the brand setting is as follows.

1	Setpoint (FINAL) The setpoint for the weighing is set. The setting is made in the range of [0] to [999 999] in every [1] step with ten keys input. [0] is set as default.

2	Prevent scatter (PREVENT SCATTER) The prevent scatter can prevent the weighing material from dispersing by gradually opening the gate when the weighing material is flowed into. The prevent scatter is selectable from [ARBITRARY CONTROL] or [QUADRATIC CONTROL]. [OFF] is set as default. Refer to Chapter 11.5 for the details.
3	Full flow (FULL FLOW) The control method of the full flow is set. The control method is selectable from [FIXED OPEN(TIME)] or [FIXED OPEN(WEIGHT)]. [FIXED OPEN(TIME)] is set as default. When full flow is finished, the output of full flow is turned off. Refer to Chapter 11.2 for the details.
4	Middle flow (MEDIUM FLOW) The control method of middle flow is set. The control method is selectable from [FIXED OPEN (TIME)], [FIXED OPEN (WEIGHT)], [ARBITRARY CONTROL] or [QUADRATIC CONTROL]. [QUADRATIC CONTROL] is set as default. When middle flow is finished, the output of middle flow is turned off. Refer to Chapter 11.3 for the details.
5	Fine flow (DRIBBLE FLOW) The control method of fine flow is set. The control method is [FIXED OPEN (WEIGHT)]. When fine flow is finished, the output of fine flow is turned off. Refer to Chapter 11.4 for the details.
6	Over setpoint (OVER) The value over set point is set. The setting range is from [0] to [999 999], and input in every [1]step with ten keys. [0] is set as default. When the weighing result exceeds the value of [FINAL + OVER], the output of OVER is turned on.

Note:

If the start signal is input when full flow, middle flow and fine flow are the following conditions, the display becomes [SQ.ERR3].

- When the setting of full flow is [FIXED OPEN (WEIGHT)] and the setting of middle flow is [FIXED OPEN (WEIGHT)], and full flow [FIXED OPEN (WEIGHT)] < middle flow [FIXED OPEN (WEIGHT)] < fine flow [FIXED OPEN (WEIGHT)].
- When the setting of full flow is except [FIXED OPEN (WEIGHT)] and the setting of middle flow is except [FIXED OPEN (WEIGHT)], and full flow [FIXED OPEN (WEIGHT)] < fine flow [FIXED OPEN (WEIGHT)].
- When the setting of full flow is [FIXED OPEN (TIME)] and the setting of middle flow is [FIXED OPEN (WEIGHT)], and middle flow [FIXED OPEN (WEIGHT)] < fine flow [FIXED OPEN (WEIGHT)].

7	Under setpoint (UNDER) The shortage value is set. The setting range is from [0] to [999 999], and input in every [1] step with ten keys. [0] is set as default. When the weighing result is under the value of [fixed value-OVER], the output of UNDER is turned on.
8	Near zero (Empty) (ZERO BAND) The value that can output the signal of "Near zero" is set. The setting range is from [0] to [999 999], and input in every [1] step with ten keys. [0] is set as default. The value of [?Gross weight?or?Net weight?] is under "Near Zero", and then Near zero (ZERO BAND) output turns on. Refer to Chapter 11.7.2 for the details.
9	Full (FULL) The value that outputs the "Full" amount is set. The setting range is from [0] to [999 999], and input in every [1] step with the ten keys. [0] is set as default. When gross weight or net weight exceeds the "Full" value, the FULL output turns ON. Refer to Chapter 11.7.2 for the details.
10	AUTOMATIC FREE-FALL COMPENSATIOIN (A.F.F. COMPENSATION) The effective width for the automatic free-fall compensation is set. The setting range is from [0] to [999 999], and input in every [1]step with ten keys. At the time of [0] setting, the automatic free-fall compensation turns off. [0] is set as default. Please refer to Chapter 11.6.5 for the details.
11	SUPPLEMENTARY FLOW TIME (SUPPLEMENTARY FLOW TIME) The time of supplementary flow is the function to apply fine flow automatically during the fixed time when the status becomes a lack condition. The setting range is from [0.00] to [99.99], and input in every [0.01] second with ten keys. [0.00] is set as default. Please refer to Chapter 11.6.3 for the detailed timing chart.
12	JUDGE.AFTER S-FLOW WAIT (JUDGE. AFTER S-FLOW WAIT) T he judgment waiting time after supplementary flow is set. The setting range is from [0.00] to [99.99], and input in every [0.01] second with ten keys. [0.00] is set as default.
13	Accumulation value (ACCUM. VALUE) This function is used in the confirmation or the clear of the accumulation value for an effective brand. When the accumulation value is cleared, the accumulation times of an effective brand is also cleared.

14	Accumulation times (ACCUM.TIMES) This function is used in the confirmation and the clear of the accumulation times of an effective brand. When the accumulation times is cleared, the accumulation value of an effective brand is also cleared.
15	Preset tare value (PRESET TARE) When preset tare cancellation is applied, the tare weight cancellation value is set. The setting range is from [0 to 999 999], and input in every [1] with ten keys. [0] is set as default. Refer to Chapter 9.11.

11.2 Coarse flow (FULL FLOW)

The control method of gate at full flow is set.

The control method is selectable from [FIXED OPEN (TIME)] or [FIXED OPEN (WEIGHT)]. The open rate and the completing time of full flow are set for [FIXED OPEN (TIME)]. The open rate and the weight are set for [FIXED OPEN (WEIGHT)].

[FIXED OPEN (TIME)] is set as default.

11.2.1 Switch to coarse flow screen

The screen is switched from weighing screen to coarse flow screen by the following operation.

1. Select [MENU].
2. Select [BRAND CODE] in menu screen 1/2.
3. Select [FULL FLOW] in brand code screen 1/2.

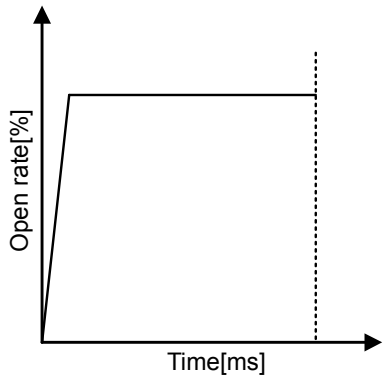
11.2.2 Coarse flow fixed open rate (time)

The open rate of the gate in coarse flow and the completing time of coarse flow are set.

The open rate is a relative value to the full open position at the gate.

The setting range of open rate of the gate is from [0.000 %] to [100.000 %] and the setting range of the completing time of coarse flow is from [50 ms] to [10 000 ms].

[50.000 %] is set as default for open rate of the gate, and [50 ms] for the completing time of coarse flow.



Note:

The open rate is a relative value to the full open position at the gate.

In this control method, the gate reaches the open rate set before at once, and is maintained until the completing time.

1. Select [FULL FLOW] in coarse flow screen, and select [FIXED OPEN (TIME)], and then tap [OK].
2. Tap [FIXED OPEN (TIME)] in coarse flow screen to inputting the each value.
3. Select [TIME], and input the completing time of coarse flow by ten keys, and then tap [OK].
4. Select [OPEN], and input the open rate of the gate by ten keys, and then tap [OK].

11.2.3 Coarse flow fixed open rate (weight)

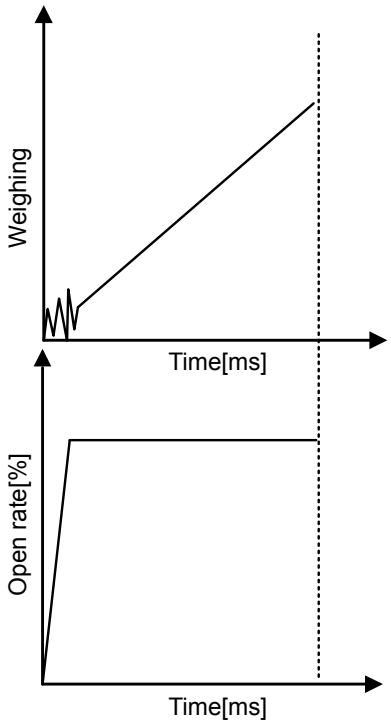
The open rate of the gate in full flow and the weight are set.

The open rate is a relative value to the full open position at the gate.

The setting range of open rate of the gate is from [0.000 %] to [100.000 %]

The setting range of the weight is from [0] to [999 999].

[50.000 %] is set as default for open rate of the gate, and [1 000] for the weight.



Note:

- The open rate is a relative value to the full open position at the gate.
- In this control method, the gate reaches the open rate set before at once, and is maintained until the completing time.

1. Select [FULL FLOW] in coarse flow screen, and select [FIXED OPEN (WEIGHT)]. And then, tap [OK].
2. Tap [FIXED OPEN (WEIGHT)] in coarse flow screen to inputting the each value.
3. Select [WEIGHT], and input the weight that reaches in coarse flow with ten keys, and then tap [OK].
4. Select [OPEN], and input the open rate of the gate with ten keys, and then tap [OK].

11.3 Middle flow (MEDIUM FLOW)

The control method of gate at middle flow is set.

The control method is selectable from [FIXED OPEN (TIME)], [FIXED OPEN (WEIGHT)], [ARBITRARY CONTROL] or [QUADRATIC CONTROL]. The open rate of the gate and the completing time of middle flow are set for [FIXED OPEN (TIME)] and the open rate of the gate and the weight are set for [FIXED OPEN (WEIGHT)]

11.3.1 Switch to middle flow screen

The screen is switched from weighing screen to middle flow screen by the following operation.

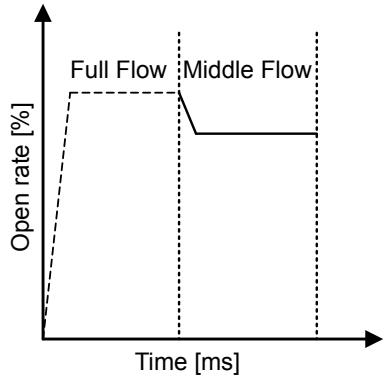
1. Select [MENU].
2. Select [BRAND CODE] in menu screen 1/2.
3. Select [MEDIUM FLOW] in brand code screen 1/2.

11.3.2 Middle flow fixed open rate (time)

The open rate of the gate in middle flow and the completing time of middle flow are set.

The open rate is a relative value to the full open position at the gate. The setting range of open rate of the gate is form [0.000 %] to [100.000 %] and the setting range of the completing time of middle flow is from [50 ms] to [10 000 ms].

[50.000 %] for open rate of the gate, and [50 ms] for the completing time of middle flow is set as default.



Note:

- The open rate is a relative value to the full flow position at the gate.
- In this control method, the gate reaches the open rate set before at once, and is maintained until the completing time.

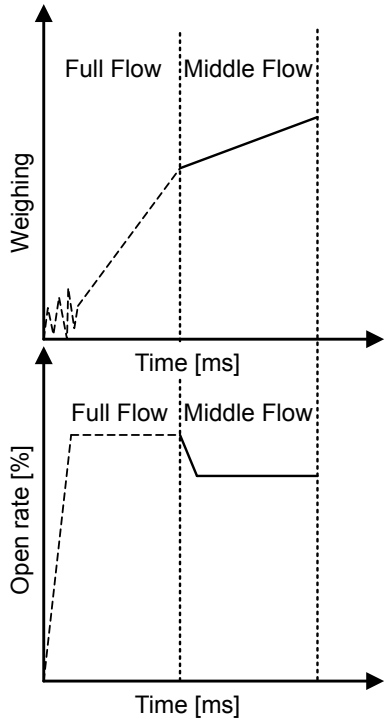
1. Select [MEDIUM FLOW] in middle flow screen, and select [FIXED OPEN (TIME)], and then tap [OK].
2. Select [FIXED OPEN (TIME)] in the middle flow screen to inputting the each value.
3. Select [TIME], and input the completing time of middle flow by ten keys, and then tap [OK].
4. Select [OPEN], and input the open rate of the gate by ten keys, and then tap [OK].

11.3.3 Middle flow fixed open rate (weight)

The open rate of the gate in middle flow and the weight are set.

The open rate is a relative value to the full flow position at the gate. The setting range of open rate of the gate is from [0.000 %] to [100.000 %] and the setting range of the weight is from [0] to [999 999].

[50.000 %] for open rate of the gate, and [1 000] for the weight is set as default.



Note:

- The open rate is a relative value to the full flow position at the gate.
- In this control method, the gate reaches the open rate set before at once, and is maintained until the completing time.

1. Select [MEDIUM FLOW] in medium flow screen, and select [FIXED OPEN (WEIGHT)], and then tap [OK].
2. Tap [FIXED OPEN (WEIGHT)] in medium flow screen to input the each value.
3. Select [WEIGHT], and input the weight that reaches in medium flow with ten keys, and then tap [OK].
4. Select [OPEN], and input the open rate of the gate by ten keys, and then tap [OK].

11.3.4 Arbitrary control of middle flow

You can set up to 50 points for the open rate during middle flow and the time that reaches that open rate.

The open rate is a relative value to the full flow position at the gate. The total time of each point becomes the completing time of middle flow.

The setting range of open rate of the gate is from [0.000 %] to [100.000 %] and the setting range of the completing time of middle flow is from [50 ms] to [10 000 ms].

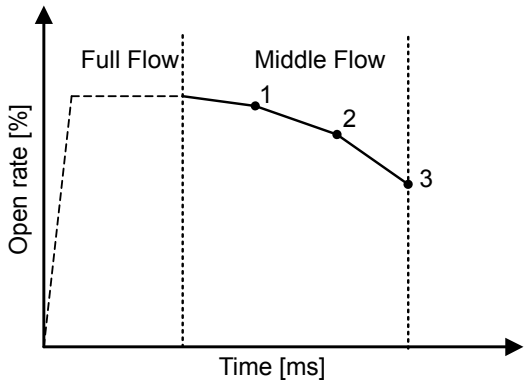
Default setting:

When registering 3 points

Point 1: Open rate of the gate [80.000 %], Time [500 ms]

Point 2: Open rate of the gate [50.000 %], Time [500 ms]

Point 3: Open rate of the gate [20.000 %], Time [500 ms]



Note:

- The open rate is a relative value to the full flow position at the gate.
- In this control method, the gate operates continuously by the constant speed until reaching the open rate set before at the set time.

1. Select [MEDIUM FLOW] in middle flow screen, and select [ARBITRARY], and then tap [OK].
2. Select [ARBITRARY] in the middle flow screen.
3. Select [NUMBER OF POINTS] in arbitrary control screen, and input the numbers of points with ten keys, and then tap [OK].
4. Select [TIME] for each point, input the time to reach open rate with ten keys, and then tap [OK].
5. Select [OPEN] for each point, and input the open rate of the gate. And then, tap [OK].

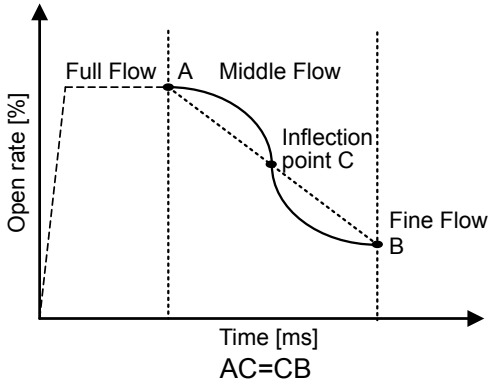
11.3.5 Quadratic control of middle flow

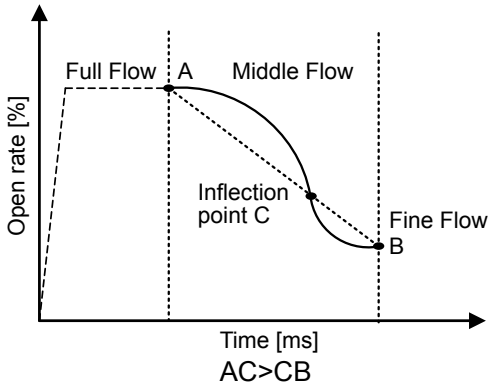
The quadratic control can control the vibrational component by a rapid change in the flow rate by smoothly changing the flow rate.

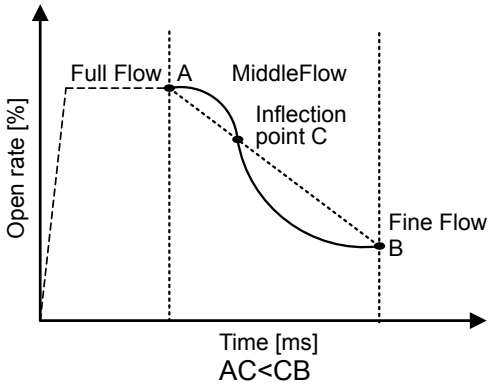
Inflection point C is located on the straight line that connects open rate A at the time of completion of full flow and open rate B at the time of starting of fine flow. The control characteristic can be changed by the set value of inflection point C. Time from A to B becomes the completion time of middle flow.

You can set the completion time of middle flow in the range from [50 ms] to [10 000 ms], and the inflection point C as the percentage between the completion time and AC of middle flow in the range from [0.00 %] to [100.00 %].

The default has set [2 000 ms] for the completion time of middle flow and [50.00 %] for the inflection point. In this case, the inflection point C is located after 1 000 ms from A.







Note:

In this control method, the gate operates continuously by always changing speed until reaching the open rate set before at the set time.

1. In middle flow screen, select [MEDIUM FLOW], and select [QUADRATIC EQUATION], and then tap [OK].
2. Select [QUADRATIC EQUATION] in the middle flow screen to inputting the each value.
3. Select [TIME] in quadratic control screen, and input the completion time of middle flow with ten keys, and then tap [OK].
4. Select [INFLECTION POINT], and input the percentage between A and C with ten keys, and then tap [OK].

11.4 Fine flow (DRIBBLE FLOW)

The control method of Fine flow is set.

The control method is [FIXED OPRN (WEIGHT)].

The open rate of the gate and the weight for [FIXED OPEN (WEIGHT)] are set.

11.4.1 Switch to fine flow screen

The screen is switched from weighing screen to fine flow screen by the following operation.

1. Select [MENU].
2. Select [BRAND CODE] in menu screen 1/2.
3. Select [DRIBBLE FLOW] in brand code screen 1/2.

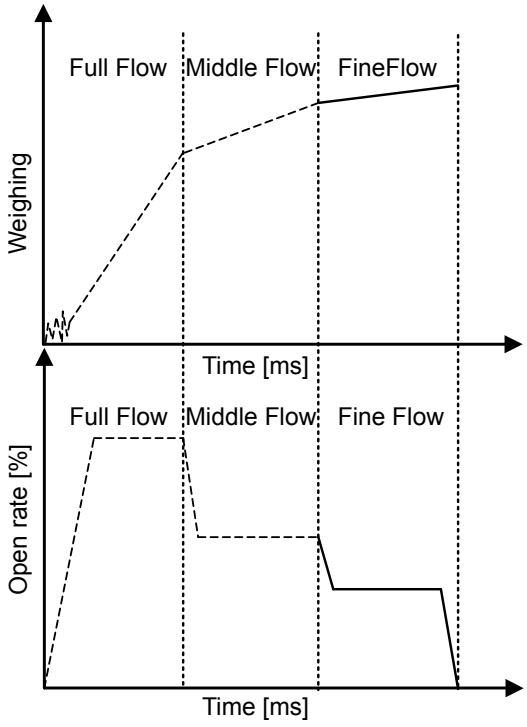
11.4.2 Fine flow fixed open rate (weight)

The open rate in the fine flow and the weight are set.

The open rate is a relative value to the full flow position at the gate.

The setting range of open rate of the gate is from [0.000 %] to [100.000 %] and the setting range of the weight is from [0] to [999 999].

[10.000 %] for open rate of the gate, and [100] for the weight is set as default.



Note:

- The open rate is a relative value to the full open position at the gate.
- In this control method, the gate reaches the open rate set before at once, and is maintained until the weight set before.

1. Select [FIXED OPEN (WEIGHT)] in the fine flow screen.
2. Select [WEIGHT], and input the weight value that reaches in fine flow with ten keys, and then tap [OK].
3. Select [OPEN], and input the open rate of the gate with ten keys, and then tap [OK].

11.5 Prevent scatter (PREVENT SCATTER)

When full flow turns on, the weighing material might disperse by the power when the gate becomes full open at a dash according to a kind of weighing material or system.

Dispersion is prevented by gradually opening the gate. The control method is selectable from [ARBITRARY CONTROL] or [QUADRATIC CONTROL].

[ARBITRARY CONTROL] can set up to 3 points of the open rate of the gate and the time that reaches the open rate.

[QUADRATIC CONTROL] can set the time that reaches the open rate in full flow. [OFF] is set as default.

11.5.1 Switch to prevent scatter screen

The screen is switched from weighing screen to prevent scatter screen by the following operation.

1. Select [MENU].
2. Select [BRAND CODE] in menu screen 1/2.
3. Select [PREVENT SCATTER] in brand code screen 1/2.

11.5.2 Arbitrary control of prevent scatter

Arbitrary control of scatter prevention can set up to 3 points of the open rate of the gate and the time that reaches the open rate. The open rate is a relative value to the full flow position at the gate.

The setting range of open rate of the gate is from [0.000 %] to [100.000 %] and the setting range of the completing time of full flow is from [50 ms] to [10 000 ms].

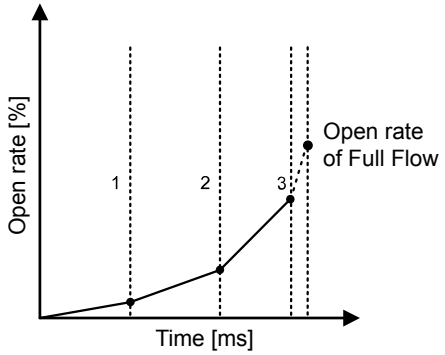
Default setting:

When registering 3 points,

Point 1: Open rate of the gate [10.000 %], Time [500 ms]

Point 2: Open rate of the gate [25.000 %], Time [500 ms]

Point 3: Open rate of the gate [50.000 %], Time [500 ms]



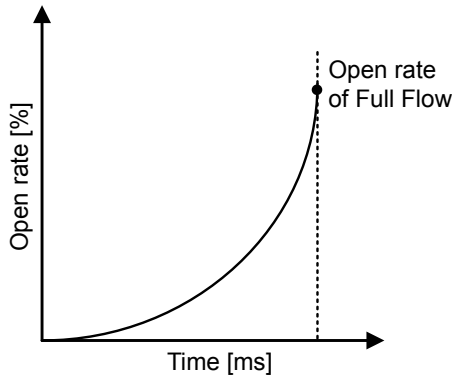
Note:

- The open rate is a relative value to the full flow position at the gate.
- Please set for open rate of scatter prevention arbitrary control to open smoothly in full flow.
- In this control method, the gate operates continuously by the constant speed until reaching the open rate set before at the set time.
- The gate moves from point 3 to the open rate of full flow at once.

1. Select [PREVENT SCATTER] in scatter prevention screen, and select [ARBITRARY], and then tap [OK].
2. Select [ARBITRARY] in scatter prevention screen.
3. Select [NUMBER OF POINTS] in scatter prevention screen, and input the numbers of points with ten keys, and then tap [OK].
4. Select [TIME] for each point, and input the time to reach open rate by ten keys, and then tap [OK].
5. Select [OPEN] for each point, and input the open rate of the gate. And then tap [OK].

11.5.3 Quadratic control of prevent scatter

This controls the gate by calculating the quadratic value based on the time until reaching the open rate of the gate in full flow.



Note:

In this control method, the gate operates continuously by the always changing speed until reaching the open rate of full flow at the set time.

1. Select [PREVEN SCATTER] in scatter prevention screen, and select [QUADRATIC EQUATION] and then tap [OK].
2. Select [QUADRATIC EQUATION] in scatter prevention screen.
3. Select [TIME], and input the opening time in specified open rate with ten keys, and then tap [OK].

11.6 Control mode

The weighing mode includes the batching mode and the discharge mode.

Set this in Chapter 11.7. Moreover, Supplementary batching, Nuzzle batching and automatic free flow compensation can be set if necessity requires.

11.6.1 Batching mode

The sequential batching mode is a mode to control the weighing sequence depending on the increased amout of weighing value or the control time when the raw material is batching in.

Judgment conditions

Status display	Judgment condition
ZERO BAND	?Gross weight (or Net weight) ?≤ Set value of ZERO BAND
FULL FLOW	When you set to [FIXED OPEN (Weight)] Net weight ≥ Final (Setpoint) – Set weight
	When you set to [FIXED OPEN (TIME)] Passing from the time for start weighing to completion time of coarse flow
MEDIUM FLOW	When you set to [FIXED OPEN (Weight)] Net weight ≥ Final (Setpoint) – Set weight
	When you set to [FIXED OPEN (TIME)], [QUADRATIC EQUATION] or [ARBITRARY] Passing from the completion time for coarse flow to completion time of middle flow
DRIBBLE FLOW	Net weight ≥ Final (Setpoint) – Set weight
UNDER	Net weight < Final (Setpoint) – Under
OVER	Net weight > Final (Setpoint) + Over
OK	Final (Setpoint) – Under ≤ Net weight ≤ Final (Setpoint) + Over

Operating explanation

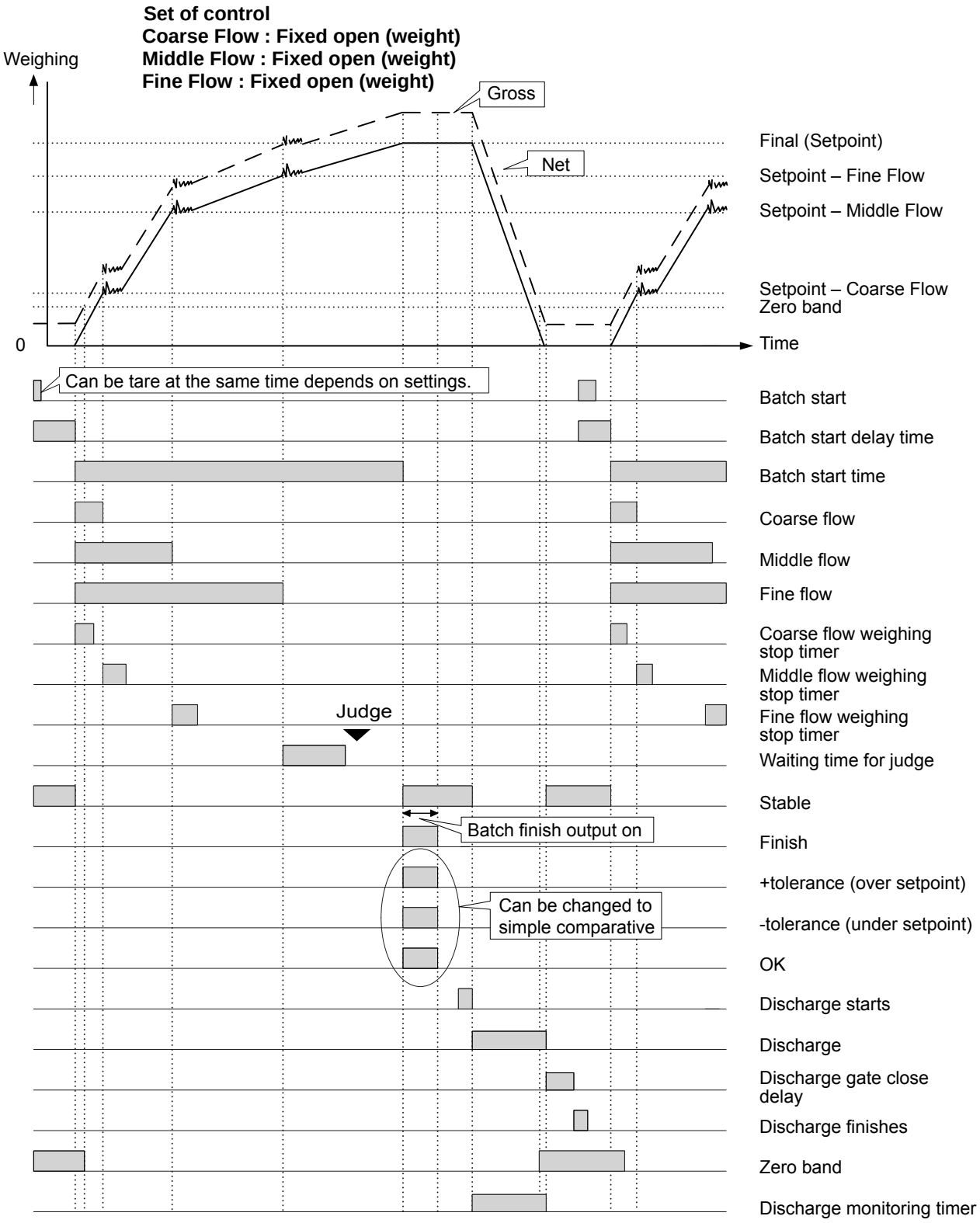
- When the start signal is input, Coarse flow, Middle flow and Fine flow turns on. Moreover, tare weight cancellation is provided with the input of start signal with the setting at the same time.
- The output of coarse flow turns off when net weight becomes the value of [FINAL – SET WEIGHT (FULL FLOW)] or the time of [Passing from the time for start weighing to completion time of coarse flow].
- The output of middle flow turns off when net weight becomes the valule of [FINAL – SET WEGHT (MEDIUM FLOW)] or the time of [Passing from the completion time for coarse flow to completion time of middle flow].
- When the net weight becomes [Final (Setpoint) – Set weight (Fine flow)], then the output of Fine flow turns off.
  - The comparative target of ZERO BAND (Empty) and the comparative target of FULL value is selectable from [GROSS], [NET], [?GROSS?], [?NET?] or [OFF].
  - The near zero is simple comparison operation.
  - Coarse flow, Middle flow and Fine flow will never become ON until the next start signal will be input, once it turns off.

- UNDER, OVER and OK can be operated with net weight. The comparison operation can be changed to simple comparison.
- When applying the automatic tare cancellation at the time of flow start, [EFFECTIVE] must be set (refer to Chapter 11.8.2.

Note:

- The gate returns to origin point automatically when the display becomes [OL] or [OVF] while weighing.
- Start weighing after returning the gate to the original point.

  When the weighing signal of gate is input excluding the original point position, the screen shows [SQ.ERR11].



11.6.2 Sequential batching mode

The sequential batching mode is to control the weighing sequence by the decrease value of weighed value or the control time when the weighing object is baching out.

Judgment conditions

Status display	Judgment condition
ZERO BAND	?Gross weight (or Net weight) ?≤ Set value of ZERO BAND
FULL FLOW	Set to [FIXED OPEN (Weight)] –Net weight ≥ Final (Setpoint) – Set weight
	Set to [FIXED OPEN (TIME)] Passing from the time for start weighing to completion time of coarse flow
MEDIUM FLOW	Set to [FIXED OPEN (Weight)] –Net weight ≥ Final (Setpoint) – Set weight
	Set to [FIXED OPEN (TIME)], [QUADRATIC EQUATION] or [ARBITRARY] Passing from the completion time for coarse flow to completion time of medium flow
DRIBBLE FLOW	–Net weight ≥ Final (Setpoint) – Set weight
UNDER	–Net weight < Final (Setpoint) – Under
OVER	–Net weight > Final (Setpoint) + Over
OK	Final (Setpoint) – Under ≤ Net weight ≤ Final (Setpoint) + Over

Operating explanation

- When the start signal is input, Coarse flow, Middle flow and Fine flow turns ON.

  Moreover, tare weight cancellation is provided with the input of start signal with the setting at the same time.

- The output of coarse flow turns off when net weight becomes the value of –[FINAL – SET WEIGHT (FULL FLOW)] or the time of [Passing from the time for start weighing to completion time of coarse flow].

- The output of middle flow turns off when net weight becomes the valule of –[FINAL – SET WEGHT (MEDIUM FLOW)] or the time of [Passing from the completion time for coarse flow to completion time of middle flow].

- When the net weight becomes [Final (Setpoint) – Set weight (Fine flow)], then the output of Fine flow turns off.

  - The comparative target of ZERO BAND (Empty) and the comparative target of FULL value is selectable from [GROSS], [NET], [?GROSS?], [?NET?] or [OFF].

  - The near zero is simple comparison operation.

  - Coarse flow, Middle flow and Fine flow will never become ON until the next start signal will be input, once it turns off.

  - Under, Over and OK can be operated with net weight.

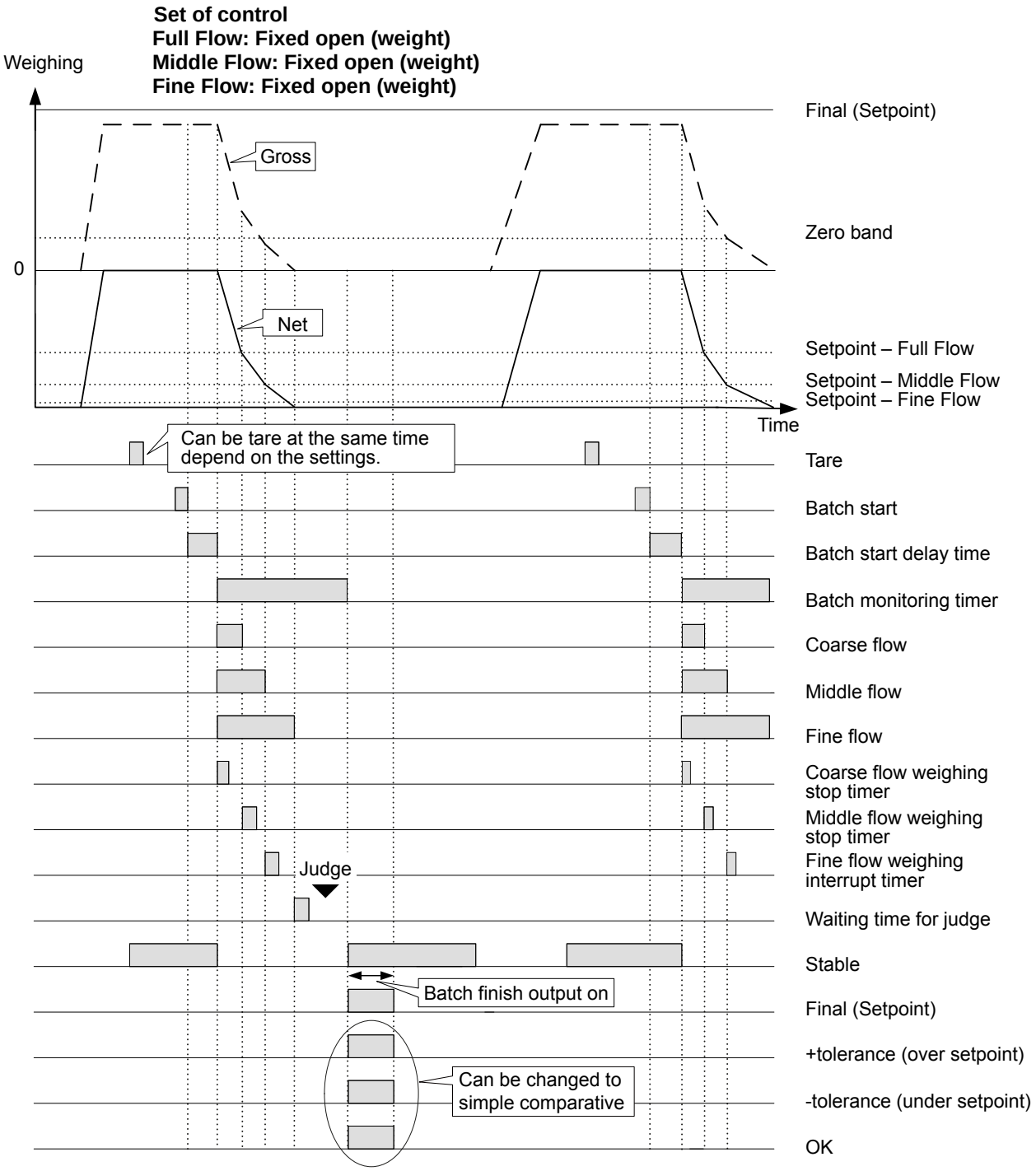
    The comparison operation can be changed to simple comparison.

  - When applying the automatic tare cancellation at the time of flow start, [EFFECTIVE] must be set (refer to Chapter 11.8.2).

Note:

- The gate returns to origin point automatically when the display becomes [OL] or [OVF] while weighing.
- Start weighing after returning the gate to the original point.

  When the weighing signal of gate is input excluding the original point position, the screen shows [SQ.ERR11].



11.6.3 Supplementary Batch (discharge) mode

Supplementary batch (discharge) is a function to turn on the fine flow automatically in a fixed time, when the batch (discharge) weight becomes short in the Sequential batch (discharge) mode.

The maximum times of supplementary flow is set in the sequence control setting (refer to Chapter 11.8.2).

The time of supplementary flow and the waiting time after the supplementary flow for each brand (product) is set (refer to Chapter 11.1.4).

Judgment conditions

Status display	Judgment condition
ZERO BAND	?Gross weight (or Net weight) ? ≤ Set value of ZERO BAND
FULL FLOW	When you set to [FIXED OPEN (Weight)] Net weight ≥ Final (Setpoint) – Set weight
	When you set to [FIXED OPEN (TIME)] Passing from the time for start weighing to completion time of coarse flow
MEDIUM FLOW	When you set to [FIXED OPEN (Weight)] Net weight ≥ Final (Setpoint) – Set weight
	When you set to [FIXED OPEN (TIME)], [QUADRATIC EQUATION] or [ARBITRARY] Passing from the completion time for coarse flow to completion time of middle flow
DRIBBLE FLOW	Net weight ≥ Final (Setpoint) – Set weight
UNDER	Net weight < Final (Setpoint) – Under
OVER	Net weight > Final (Setpoint) + Over
OK	Final (Setpoint) – Under ≤ Net weight ≤ Final (Setpoint) + Over

Operating explanation

- When the start signal is input, Full flow, Medium flow and Dribble flow turns ON.

  Moreover, tare weight cancellation is provided with the input of start signal with the setting at the same time.

- The output of full flow turns off when net weight becomes the value of –[FINAL – SET WEIGHT (FULL FLOW)] or the time of [Passing from the time for start weighing to completion time of full flow].

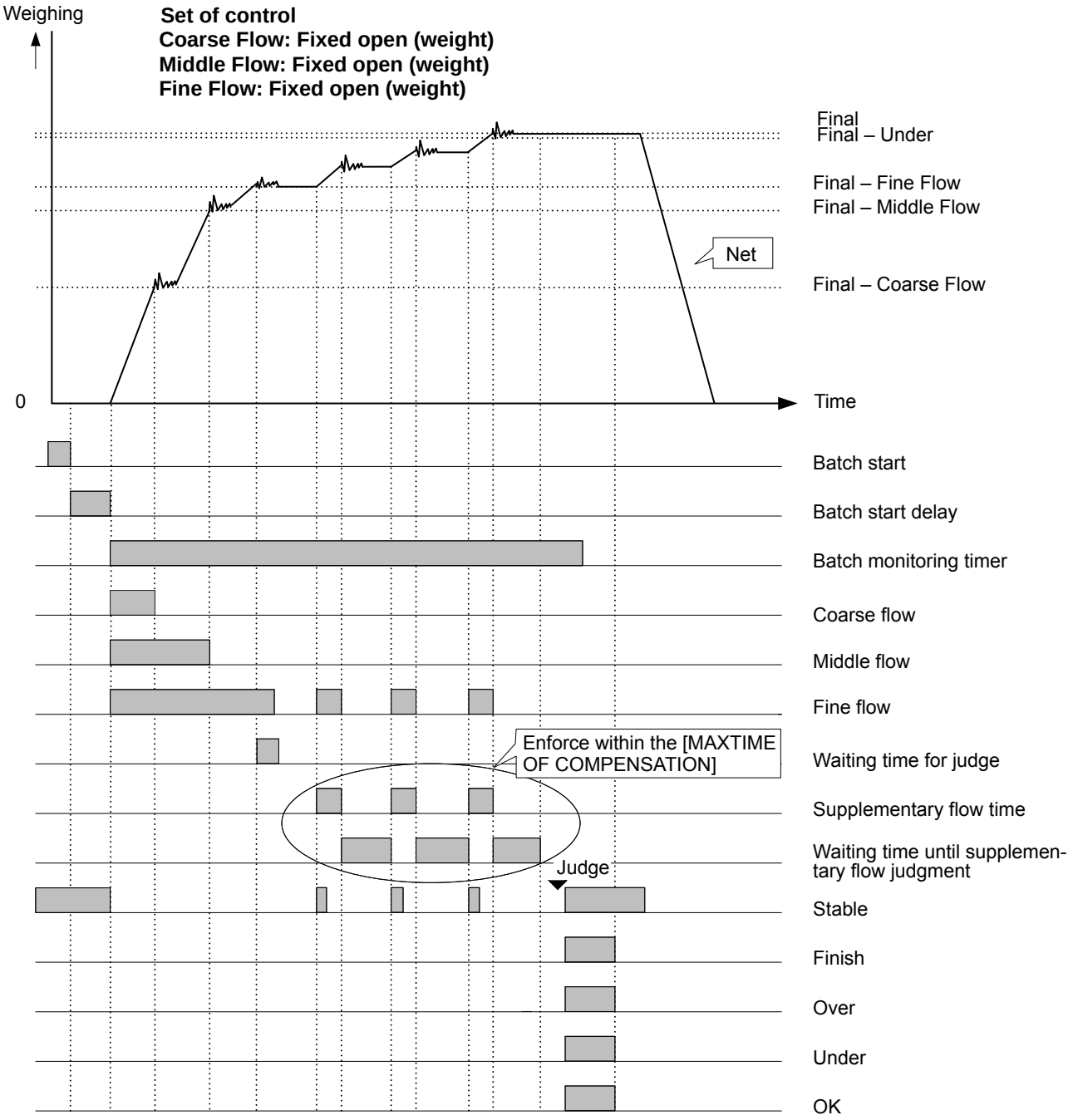
- The output of medium flow turns off when net weight becomes the valule of –[FINAL – SET WEGHT (MEDIUM FLOW)] or the time of [Passing from the completion time for full flow to completion time of medium flow].

- When the net weight becomes [Final – Set weight(Dribble flow)], then the output of Dribble flow turns OFF.

- After completing the Dribble flow, the supplementary flow starts when UNDER signal is output in stable time. The time of this supplementary flow becomes the set time for each bland.

- The supplementary flow is executed up to the times set by the maximum times of supplementary flow described in Chapter 11.8.2. When the Under signal does not output at less times than the set value, the supplementary flow shall be finished at that time.
- The UNDER signal is output even if the supplementary flow is applied with the same times of the maximum supplementary flow, it will become the sequence error (SQ ERR2).
  - The comparative target of ZERO BAND and the comparative target of FULL value is selectable from [GROSS], [NET], [?GROSS?], [?NET?] or [OFF].
  - The near zero is simple comparison operation.
  - Coarse flow, Middle flow and Fine flow will never become ON until the next start signal will be input, once it turns OFF.
  - Under, Over and OK can be operated with net weight.

    The comparison operation can be changed to simple comparison.
  - When applying the automatic tare cancellation at the time of flow start, [EFFECTIVE] must be set (refer to Chapter 11.8.2).



11.6.4 Nozzle control sequence

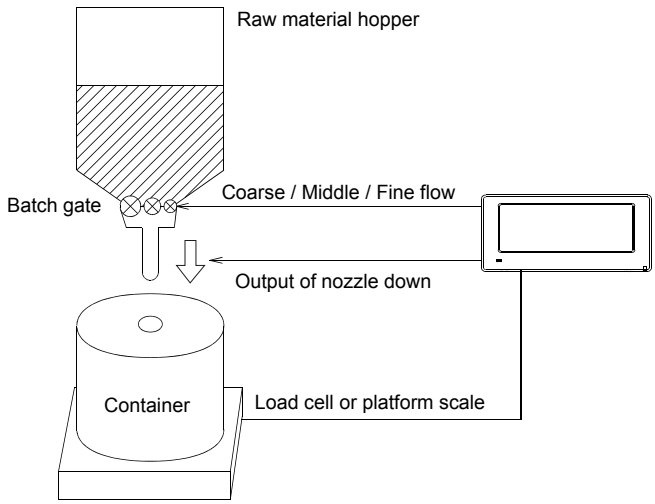
This function is used when the matearial filled to the bottle through the inserted nozzle is measured.

Before starting Flow, the output of nozzle DOWN turns on automatically, and the nozzle is inserted into the container.

When the Dribble flow has completed, the output of DOWN turns off and the finish of measurement is judged with the nozzle pulled off.

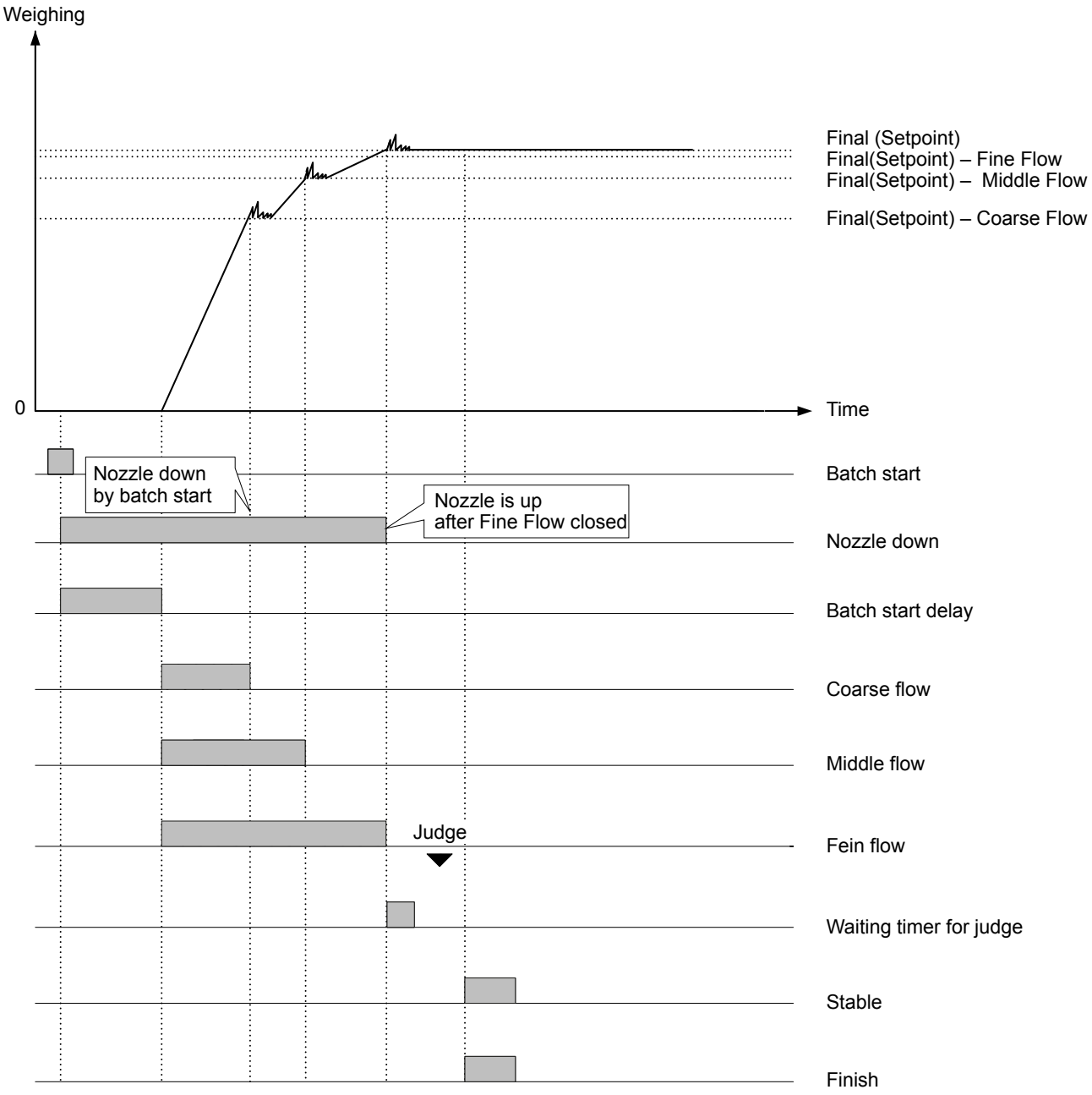
During the nozzle DOWN (Waiting time of Flow start), when the Near zero is exceeded (the case of the nozzle touched to the container is assumed), the sequence error [SQ.ERR 8] is occurred and the control is stopped.

In order to execute the Nozzle control sequence [EFFECTIVE] must be set (refer to Chapter 11.8.2).



Note:

- The nozzle control sequence becomes effective only in batching mode.
- As for the waiting time for the Nozzle down, it will be the same value applied the setting for the waiting time for Batch start (refer to Chapter 11.8.2).



11.6.5 Automatic Free Fall correction

This is a function to guess the next Free Fall from a former actual Free Fall, and to set the value of the Free Fall automatically when the measurement is operated continuously.

The set data of the next Free Fall uses the moving averaged value calculated from 4 times of actual former Free Fall values.

When using the function, set the Automatic Free Fall correction to [EFFECTIVE] (refer to Chapter 11.8.2), and also set the value of Automatic Free Fall effective width in each Brand (refer to Chapter 11.1.4).

When the Batch error (= ?measured value - FINAL value?) is exceeded to the Automatic Free Fall effective width set at each BRAND, the data is treated as invalid data, and the Automatic Free Fall calculation is not operated.

When the value of automatic Free Fall effective width is 0, an Automatic Free Fall calculation will not be operated.

The Automatic Free Fall compensationrrection is cleared when the change of set value or the BRAND number has changed, or at the time of turning off the power supply.

11.6.6 Input of SAFETY CONFIRMATION

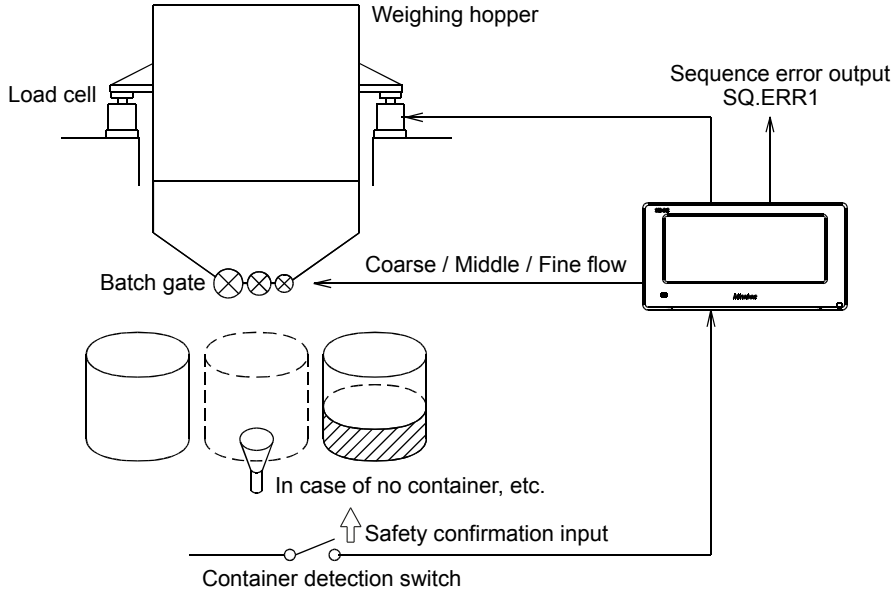
The input of safety confirmation is a function to stop the measurement sequence automatically when abnormality is occurred such as the hopper used is fallen down and the vessel for the measurment is not prepared.

[Safety confirmation input 1 to 8] allocated to exeternal control input function. (CONTROL I/O) is used for the input of safety confirmation.

Refer to Chapter 10.3.1 for the setting method of Safety confirmation. The safety confirmation input is registered up to 8 items.

The input used is specified by setting the safety confirmation condition.

Turn on each safety confirmation of [BATCHING SAFETY CHECK], [DISCH. SAFETY CHECK] and [GENERAL SAFETY CHECK] (refer to Chapter 11.7.2).



11.6.7 MIXING mode

The MIXING mode is to be used for control the motor that works to mix the object to be measured.

The MIXING signal is output from the connector pin set to [MIX] by the external control I/O.

The output timing of MIX signal (start mixing) can be set to each of [BATCH FINISH], [DISCHARGE FINISH] and [MIXING FINISH] (Plurals can be selected), refer to Chapter 11.8.2.

[MIXING TIME OUTPUT ON] is to set the output time of MIXING signal .

[MIXING FINISH OUTPUT ON] is to set the output time of MIXING finish signal .

Refer to Chapter 11.8.2.

Note:

As for the set value of [MIXING output time] and [MIXING finish output time], these are common in [Batch finish] and [Discharge finish].

11.6.8 DISCHARGE mode

The DISCHARGE mode is a mode used when the object to be discharged after the weighing is finished.

The Discharge signal is output from the connector pin set to [DISCHARGE] by the external control I/O.

The output timing of the discharge signal (start discharge) can be set to each of [OPERATION AT BATCH FINISH].

Refer to Chapter 11.8.2.

[DISCH. MONI. TIMER] is the timer for occurring sequence error when it takes time for discharge too much.

[DISCH. GATE CLOSE DELAY] is to set the time to close the gate after the measured value meets the condition of ZERO BAND in discharge.

[DISCH. FINISH OUTPUT ON] is to set the output time of the discharge finish signal.

Refer to Chapter 11.8.2.

In addition, [TARE CLEAR] and [MIXING START] is set as the morement after discharge finish.

Refer to Chapter 11.8.2.

11.6.9 Power on original point detection (POWER ON ORIGIN)

The power on original point detection detects the starting point sensor in the detection time set when the power supply is turned on. The original point detection is completed when the gate is at the position in which the original point sensor can be detected.

This setting is selectable from [EFFECTIVE] or [INVALID], and the range of detecting time is 1 s to 15 s.

The default has set as [INVALID].

1. Select [MENU]
2. Select [SERVO CALIBRATION] in menu screen 1/2.
3. Select [POSITION CALIB.] in servo calibration screen.
4. Select [POWER ON ORIGIN] in position calibration screen.
5. Select [POWER ON ORIGIN] in position calibration screen after the power turns on, and select from [EFFECTIVE] or [INVALID].
6. Tap [OK].
7. Select [DETECTION TIME], and input the detection time by ten keys.
8. Tap [OK].

Note:

- [SV.ERR ORG] lights when the original point cannot be detected by power on original point detection.
- Power on original point detection cannot be used when original point sensor is not used.

11.7 Setting Weighing operation (WEIGHING OPERATION)

The setting relates to the operation of weighing, such as control mode.

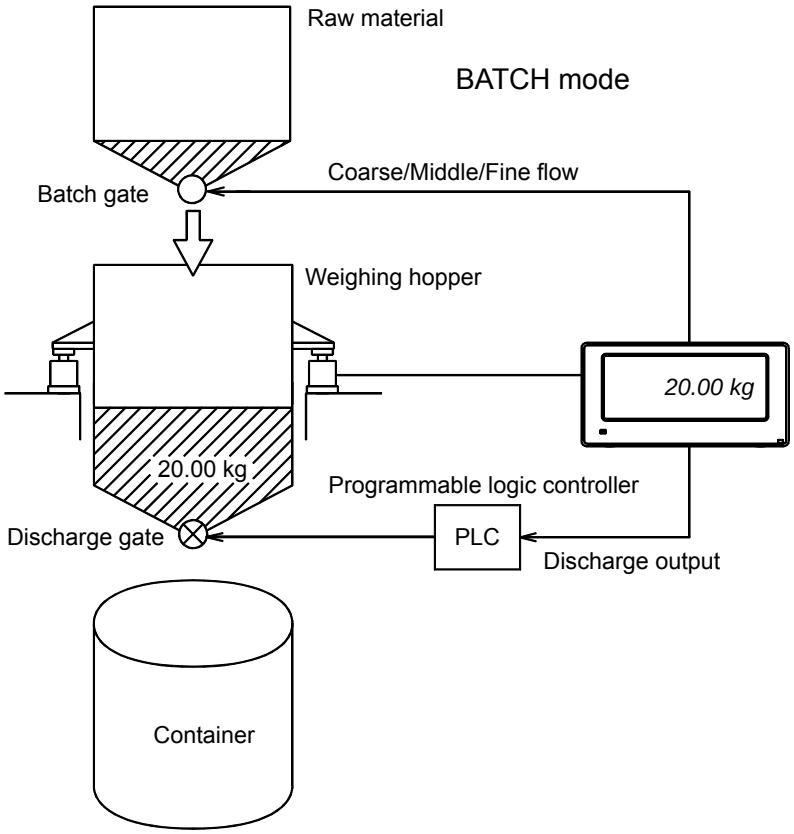
11.7.1 Change to weighing operation setting screen

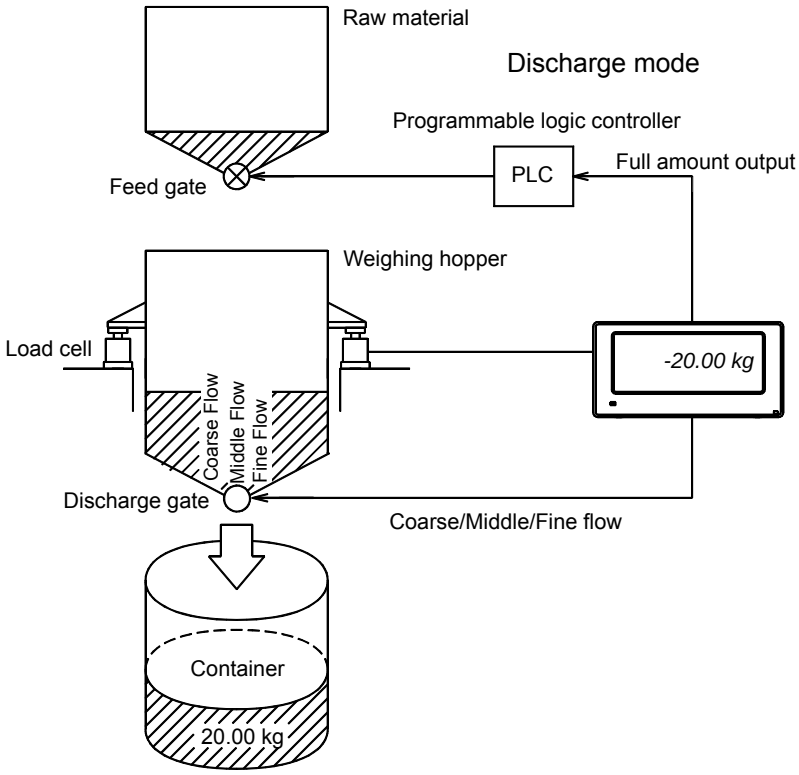
Changes from the weighing screen to the weighing operation setting screen by the following operations.

1. Select [MENU].
2. Select [WEIGHING OPERATION] in menu screen 1/2.

11.7.2 Setting item of weighing operation

1 Control mode (CONTROL MODE)
The control mode can be selected from the [Batch mode], [Discharge mode] and [External input changeover]. When the [External control changeover] is selected, the Batching mode ⇔ Discharge mode exchanges if the [BATCH/DISCHARGE] switch signal is input.
As for the setting of external control I/O, refer to Chapter 10.3.
[BATCHING mode] is selected as default.





2	Comparison signal operation (COMPARISON) The operating condition of the comparison signal is selectable from [ANYTIME], [IN STABLE MODE],[SYNC. WITH BATCH FIN] or [SYNC. BATCH FIN HOLD]. [SYNC. WITH BATCH FIN] is selectable as default.
3	Near zero (ZERO BAND) comparison operation (COMP.OF ZERO BAND) The operation condition of near zero signal is selectable from [GROSS], [NET], [comparison signal OFF], [? GROSS ? or ? NET ?]. Gross weight is selected as default.
4	FULL comparative operation (COMPARATIVE OF FULL) The operating condition of [FULL] signal is selectable from [GROSS], [NET], [comparison signal OFF], [? GROSS ? or ? NET ?]. Gross weight is selected as default.
5	Saving Automatic free fall value (SAVE THE A.F.F.) When the Brand is changed, the automatic free fall compensation value in the brand before it changes is selectable from [NO MEMORIZE] or [MEMORIZE]. [NO MEMORIZE] is selected as default.
6	Safety check condition during the BATCH (BATCHING SAFETY CHECK) The safety check condition during batch operation is set. The safety check condition is selectable from [ON] or [OFF] for each of [SAFETY CHECK 1] to [SAFETY CHECK 8] respectively. Refer to Chapter 11.6.6.

7	Safety check condition during DISCHARGE operation (DISCH.SAFETY CHECK) The safety check condition during the discharge operation is set. The safety check condition is selectable from [ON] or [OFF] for each of [SAFETY CHECK 1] to [SAFETY CHECK 8] respectively. Refer to Chapter 11.6.6.
8	Safety check condition during MIXING operation (MIXING SAFETY CHECK) The safety check condition during the mixing operation is set. The safety check condition is selectable from [ON] or [OFF] for each of [SAFETY CHECK 1] to [SAFETY CHECK 8] respectively. Refer to Chapter 11.6.6.
9	Safety check condition of whole sequence (GENERAL SAFETY CHECK) The safety check condition of whole sequence is set. The safety check condition is selectable from [ON] or [OFF] for each of [SAFETY CHECK 1] to [SAFETY CHECK 8] respectively. Refer to Chapter 11.6.6.
10	Automatic accumulation function (AUTOMATIC ACCUM) The operation condition of automatic accumulation function is selectable from [OFF], [SYNC.WITH FINISH] or [AUTO ACCUM. AT STABLE]. [OFF] is selected as default. Refer to Chapter 9.16.2 for the automatic accumulation function.
11	Automatic accumulation condition (CONDITION OF AUTO ACM.) The operation condition of automatic accumulation function is selectable from [IN OK MODE] or [NO CONDITION]. [NO CONDITION] is selected as default. Refer to Chapter 9.16.2 for the automatic accumulation function.
12	Automatic printing function (AUTOMATIC PRINT) The automatic printing function is selectable from [EFFECTIVE] or [INVALID]. [INVALID] is selected as default. Refer to Chapter 9.15 for the printing function.

11.8 Setting item of sequence control (SEQUENCE CONTROL)

The parameter in the Sequence mode is set.

11.8.1 Switch to sequence control setting screen

Changes from weighing screen to sequence control setting screen by the following operations.

1. Select [MENU].
2. Select [SEQUENCE CONTROL] on menu screen 1/2.

11.8.2 Setting item of sequence control

1	Batch start sequence (BATCH START SEQUENCE) The operational setting of [START ABOVE ZERO BAND] and [AUTOMATIC TARE] when the batch start signal is input is selectable from [EFFECTIVE] and [INVALID]. When the [START ABOVE ZERO BAND] is set as [INVALID], the error is occurred and the batch will not start if the batch start signal is input when the weighing value exceeds the level of zero band. When the [AUTOMATIC TARE] is effective, the tare weight cancellation is applied automatically at the same time of the input of batch start signal. [INVALID] is set as default for the [START ABOVE ZERO BAND] and [AUTOMATIC TARE].
2	Nozzle operation (OPERATION OF NOZZLE) The operational setting of [NOZZEL CONTROL], [CONTACT STOP SEQUENCE] and [UP AFTER COMPENSATE] in nozzle control sezuence is selectable from [EFFECTIVE] and [INVALID]. When the [NOZZLE CONTROL] is set as [EFFECTIVE], the [NOZZLE DOWN (INSERT)] signal will output from the connector pin set on the external control I/O as [NOZZLE DOWN (INSERT)] from the input of batch start signal to the time when [D.FLOW] (Fine flow) signal is fade out. When the [CONTACT STOP SEQUECE] is set as [EFFECTIVE], the sequence error is occurred and the control is stopped when the weighing value exceeds the level of zero band during the nozzle down. When the [UP AFTER COMPENSATE] is set as [EFFECTIVE], the [NOZZLE DOWN (INSERT)] signal is turned OFF at the time of judging the compensation flow. [INVALID] is all selected as default
3	Judge condition (JUDGE CONDITION) The judge condition at the time of finishing weighing is selectable from [TIMER IS UP], [STAB. AND TIMER IS UP] or [STAB. OR TIMER IS UP]. When the judgement condition is set as [TIMER IS UP], the judgement is applied after the time set with [WEIGHTINHG TIME FOR JUDGE] has been passed. When the judgement condition is set as [STAB. AND TIMER IS UP], the judgment is applied after the time set with [WAITING TIME FOR AJDGE] has been passed and when the setting condition is satisfied (refer to Chapter 9.7). When the judgement condition is set as [STAB. AND TIMER IS UP], the judgment is applied either after the time set with the [WAITING TIME FOR JUDGE] has been passed or when set condition is satisfied (refer to Chapter 9.7). [STAB. AND TIMER IS UP] is selected as default.
4	Batch finish actions (BATCH FINISH ACTIONS) The action at completing weighing for both of [MIXING START] and [DISCHARGE START] is selectable from [EFFECTIVE] or [INVALID]. When both [MIXING START] and [DISCHARGE START] are set as [EFFECTIVE], the operation is executed in the order of [MIXING] to [DISCHARGE] at the time of completion of weighing. [INVALID] is selected as default.
5	Discharge finish actions (DISCH. FINISH ACTIONS) The action at completing weighing for each of [TARE CLEAR] and [MIXING START] is selectable from [EFFECTIVE] or [INVALID]. [INVALID] is selected as default for both of [TARE CLEAR] and [MIXING START].

6	Maximum time of post-batching (MAXTIME OF COMPENSATION) The maximum time to apply the post-batching is set. This input with ten keys in the range from 0 to 255 in every [1] step, and becomes turning off when [0] is set. [0] time is set as default.
7	Comparison flow eval (COMPARISON FLOW EVAL) The judgment condition at the time of executing post-batching is selectable from [TIMER IS UP], [STAB. AND TIMER IS UP] or [STAB. OR TIMER IS UP]. When the [TIMER IS UP] is selected, the judgment is applied after the set time with [WAITING TIME FOR JUDGE] has been passed. When the [STAB. AND TIMER IS UP] is set, the judgment is applied when the set time has passed with [WAITING TIME FOR JUDGE] and when the setting condition is specified (refer to Chapter 9.7). When the [STAB. OR TIMER IS UP] is set, the judgment is applied either when the set time with [WAITING TIME FOR JUDGE] has been passed or when the setting condition is specified (refer to Chapter 9.7). [STAB. AND TIMER IS UP] is selected as default.
8	Automatic free fall compensation (A.F.F. COMPENSATION) The operation of Automatic free fall compensation is selectable from [EFFECTIVE] or [INVALID]. [INVALID] is selected as default.
9	Batch finish output off (BATCH FINISH OUTPUT OFF) The condition of turning off the output of completing weighing is selectable from [NO CONDITION], [LO OR UNSTABLE] or [ZERO BAND]. When the [NO CONDITION] is selected, FINISH signal is turned off either after the set time with [BATCH FINISH OUTPUT IN] has been passed, or when the next start signal is inputted. When the [LO OR UNSTABLE] is selected, FINISH signal is turned off either when the display becomes [OL] or [– OL], or when the output of Stable signal turns OFF. When the [ZERO BAND] is selected, FINISH signal is turned off when Zero band signal is outputted. [NO CONDITION] is set as default.
10	Tare batch start delay (TARE BATCH START DELAY) The operation of tare is executed automatically after passing the waiting time for batch start is selectable from [EFFECTIVE] or [INVALID]. [INVALID] is set as default.
11	Batch monitoring timer (BATCH MONITORING TIMER) The timer that monitors the time from the input of Start signal to the output of Finish signal is set. When the measuring time is longer than the set value, the error is output. The error is [SQ. ERR 4] when [BATCH MODE] is selected in [CONTROL MODE]. This is input with ten keys within the range from 0 to 9 999 in every [1] second, and this function becomes off when [0] is set. [0] is set as default.

12 Batch start delay timer (BATCH START DELAY TIMER)
The waiting time from the input of Batch start signal to the start of Batch is set.
The time is input with ten keys in the range from 0 to 9 999 in every [1] second, and this function becomes off when [0] is set.
[0] is set as default.

13 Fine flow comparison stop timer (F-FLOW COMP. STOP TIMER)
The time to prohibit the comparison between the set value of Fine flow and weighed value at the time of start of Batching is set. This time is input with ten keys in the range from 0.01 to 99.99 in every [0.01] second, and this function becomes off when [0.00] is set.
[0.00] is set as default.

14 Middle flow comparison stop timer (M-FLOW COMP. STOP TIMER)
The time to prohibit the comparison between the set value of Middle flow and weighed value at the time of finishing the Fine flow is set. This time is input with ten keys in the range from 0.01 to 99.99 in every [0.01] second, and this function becomes off when [0.00] is set.
[0.00] is set as default.

15 Coarse flow comparison stop timer (D-FLOW COMP. STOP TIMER)
The time to prohibit the comparison between the set value of Coarse flow and measured value at the time of finishing the Middle flow is set. This time is input with ten keys in the range from 0.01 to 99.99 in every [0.01] second, and this function becomes off when [0.00] is set.
[0.00] is set as default.

16 Waiting time for judge (WAITING TIME FOR JUDGE)
The waiting time until executing judgment after completing Fine flow is set.
This time is input with ten keys in the range from 0.01 to 99.99 in every [0.01] second, and this function becomes off when [0.00] is set.
[0.00] is set as default.

17 Discharge monitor timer (DISCH. MONI. TIMER)
The timer that monitors the time from the Discharge start to Discharge finish is set.
When Discharge time is longer than the set value, the error is output.
This time is input with ten keys in the range from 0 to 9 999 in every [1] second, and this function becomes off when [0.00] is set.
[0] is set as default.

18 Discharge gate close delay (DISCH.-GATE CLOSE DELAY)
The time from the condition that the measuring value is satisfied with zero band to closing the gate in executing the discharge is set.
This time is input with ten-keys in the range from 0.01 to 99.99 in every [0.01] second, and this function becomes off when [0.00] is set.
[0.00] is set as default.

19 Batch finish output on (BATCH FINISH OUTPUT ON)
The output time for Batch finish signal is set.
This time is input with ten-key in the range from 0.01 to 99.99 in every [0.01] second, and this function becomes off when [0.00] is set.
[0.00] is set as default.

20	Discharge finish output on (DISCH. FINISH OUTPUT ON) The output time for the Discharge finish signal is set. This time is input with ten-keys in the range from 0.01 to 99.99 in every [0.01] second, and this function becomes off when [0.00] is set. [0.00] is set as default.
21	Mixing finish output on (MIXING FINISH OUTPUT ON) The output time for the Mixing finish signal is set. This time is input with ten keys in the range from [0.01] to [99.99] in every [0.01]second, and this function becomes off when [0.00] is set. [0.00] is set as default.
22	Mixing time output on (MIXING TIME OUTPUT ON) The output time for the Mixing signal is set. This time is input with ten keys in the range from 0 to 9 999 in every [1] second, and this function becomes off when [0] is set. [0] is set as default.

12 System setting (SYSTEM)

The backlight lighting time, the data stored place, the data comparison and memory clear related to the operations are set.

12.1 Switch to the screen for system setting

The procedures to switch screen from weighing screen to system setting screen shows as follows.

1. Select [MENU].
2. Tap [NEXT] in the menu screen 1/2.
3. Select [SYSTEM] in the menu screen 2/2.

Note:

- Memory clear means return to the default.
- Clear memory does not change locked calibration entries when overwrite protection is active.

12.2 Time for backlight off (BACK-LIGHT OFF TIMER)

The time until the back light is turned off when there is no operation is set. The time is input with ten keys in the range from 1 minute to 60 minutes.

The backlight keeps lightening when [0] minutes is set.

12.3 Memory clear

12.3.1 Memory clear related to the comparative setting (COMPARATOR MEMORY CLR.)

The memory for the setting of brand is cleared.

12.3.2 Memory clear related to the operational setting (OPERATION MEMORY CLR.)

The memory for the setting of basic function, I/O, weighing operation, sequence control, standard communication and optional parts is cleared.

13 Operational check function (CHECK

In the operational check mode, the following confirmation can be processed:

- ROM Version
- Screen check
- I/O check
- Monitor
- BCD
- Analog
- Maintenance day
- Maintenance No.

13.1 Switch of operational check screen

Switch from the weighing screen to the operational check screen by the following procedure.

1. Select [MENU].
2. Tap [NEXT] in the menu screen 1/2.
3. Select [CHECK] in the menu screen 2/2.

13.2 Confirmation of ROM version

ROM version is confirmed in this function as follows.

Example of display

Model	: CSD-918		
Main CPU	: Ver. 1.200		
Sub CPU	: Ver. 1.000		
MODEL	: Whether the options are mounted with this unit or not is displayed. See the right table about the part No. of each option. Example: When it connected the current output and BCD output: → CSD-918B-07-15	**Options** Current output Voltage output BCD output RS-232C RS-422/485	**P/No.** -07 -25 -15 -74 -76
Main CPU	: The software version of main CPU is displayed.		
Sub CPU	: The software version of sub CPU is displayed.		

13.3 Screen check (CHECK OF DISPLAY)

The following three items can be confirmed in the screen check:

- Color display check

  By tapping [CHECK OF COLOR DISP.], the color of screen changes in the order to white, black, red, green and blue, and color display can be checked in order.

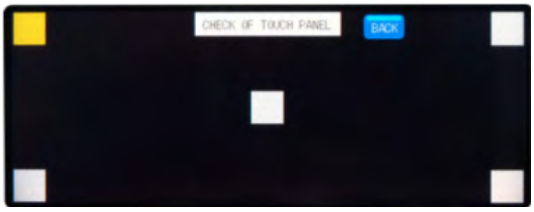
- Line display check

  By tapping [CHECK OF LINE DISP.], the screen displays the vertical line and the horizontal line, and the display in line can be checked.

- Touch panel check

  By tapping [CHECK OF TOUCH PANEL], the switches are appeared in lower right, lower left, upper right, upper left and center.

  That sign changes to yellow when you tap and the operation of touch panel can be checked.



13.4 I/O check (CHECK OF I/O)

The external control I/O can be checked.

Please confirm if the key that set when external control input is actually input is turned on.

Please confirm if the destined output is worked when the external control output is changed as ON and OFF in the touch panel from OUT1 to OUT11.

13.5 Monitor mode (MONITOR)

In the Monitor mode, the applied load on strain gage applied transducer at present is displayed with the converted unit of mV/V.

Note:

- The display value in Monitor mode is a reference value. The accuracy of display is 0.5 % approximately.
- In Monitor mode, the range which can be monitored is from -3.1 mV/V to 3.1 mV/V approximately.

13.6 Check of BCD output (BCD)

The BCD I/O can be checked. The operation at destined unit can be checked when the keys from A1 to A17 and from B1 to B17 changes as ON and OFF.

Also, the input at B18 can be checked. Please check that the key turns on by the actual input.

Note:

When two sets of BCD output are equipped with, both of two sets are the same operation. For example, when A1 is turned on, two A1 output is turned on.

13.7 Check of analog output (ANALOG OUTPUT)

Check of the analog output

Confirm the correct output when an arbitrary key is touched from [4 mA / 0 V], [8 mA / 2.5 V], [12 mA / 5.0 V], [16 mA / 7.5 V] or [20 mA / 10 V] (refer to Chapter 17.1.3).

13.8 Maintenance date (MAINTENANCE DATA)

The date that processes the maintenance, the routine inspection, etc., can be registered and confirmed.

13.9 Maintenance number (MAINTENANCE No.)

The maintained number when the maintenance, the routine inspection, etc., are executed can be registered and confirmed.

14 Storage location of setting data

In this unit, each data is recorded in RAM and EEPROM as follows:
The data in EEPROM can be stored almost permanent due to nonvolatile.

14.1 Data stored in internal RAM

- Tare weight cancellation data
- ZERO set data
- ZERO tracking data
- Brand setting data

14.2 Data stored in EEPROM

- Calibration data
- Data related to calibration

15 2-pin method serial interface (S-I/F)

15.1 Specifications of 2-pin method serial interface specification

Specification	Contents
Baud rate	600 bps
Data length	8 bit
Parity bit	Odd number
Stop bit	1 bit
Start bit	1 bit
Transmission data	Binary code and BCD

15.2 Data format

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
INTERVAL	F1	F2	F3	LEN	FUN1	FUN2	ST1	ST2	OVR	ERR	G1	G2	G3	N1	N2	N3	T1	T2	T3	BCC

1. INTERVAL — Space for 15 bit(25 ms) or more (MARK SIGNAL)
2. F1 to F3 — 0FFH code
3. LEN — 11H code
4. FUN1 — Print status
5. FUN2 — 00H code
6. ST1 — Condition
7. ST2 — Condition
8. OVR — 00H code
9. ERR — Condition
10. G1 to G3 — GROSS data
11. N1 to N3 — NET data
12. T1 to T3 — TARE data
13. BCC — Block Checking Character from LEN to T3

1) FUN1

7	6	5	4	3	2	1	0

Printing status

2) ST1

7	6	5	4	3	2	1	0

On [1] means NET display
On [1] means GROSS display

3) ST2

7	6	5	4	3	2	1	0

On [1] means preset tare is valid

4) GROSS data / NET data / TARE data

G1/N1/T1		G2/N2/T2		G3/N3/T3	
DP	10^4	10^3	10^2	10^1	10^0

Load data and BCD data

7	6	4	5

On [1] means minus
Decimal point

7	6	Decimal point
0	0	None
0	1	10^1
1	0	10^2
1	1	10^3

Note:

- Only during the measurement mode, the serial data is output.
- The data of serial interface stops to output when the maximum display is set to six digits. Set the maximum display digit within five digits when you use the data of serial interface.
- Refer to Chapter 4.7.

15.3 Explanation of format data

- Automatic print bit [FUN1: bit 0]

  This bit can be used as a trigger at receiving side of the instrument with 2-pin method serial interface.

- Display bit [ST1:bit 7, bit 6]

  Bit 7: Put [1] when the display of the instrument is gross weight.

  Bit 6: Put [1] when the display of the instrument is net weight.

15.4 Explanation of output type

- Stream mode

  The data of gross weight, net weight, etc., keeps outputting in constant intervals.

- Print mode

  In the print mode, there are 3 print signal operations, that is, [SYNC. WITH PRINT], [SYNC.WITH ACCUM] and [SYNC.WITH FIHISH].

  When each external control input of [Print signal], [Accumulation signal] and [Finish signal] are input, [1] is put to FUN1 of output format for automatic print bit.

  Refer to Chapter 15.5.

15.5 Switch to print signal operation screen (OPERATION OF PRINT)

1. Select [MENU].
2. Select [BUILT-IN SERIAL I/F] in the menu screen 1/2.
3. Select [S I/F] in the standard communication setting screen.
4. Select [OPERATION OF PRINT] in the Serial interface screen.

15.6 Changeable item of Print signal operation

The set of print signal operation is selectable from [NOTHING], [SYNC.WITH PRINT], [SYNC.WITH ACCUM] or [SYNC. WITH FIHISH].

When the setting of [SYNC. WITH PRINT] is selected, the data is transmitted after putting [1] to FUN1 of output format for automatic print bit when [Print command] is input from the external control output, etc.

When the setting of [SYNC. WITH ACCUM] is selected, the data is transmitted after putting [1] to FUN1 of output format for automatic print bit either when [Accumulation command] is input from external command I/O, etc., or when automatic accumulation is in work.

When the setting of [SYNC. WITH FINISH] is selected, the data is transmitted after putting [1] to FUN1 of output format for automatic print bit when the finish signal is output.

[NOTHING] is set as default.

16 Standard RS-485 interface

16.1 Specifications for standard RS-485 interface

Specification	Contents
Transmission method	Half duplex
Synchronous system	Start-stop synchronization
Baud rate	Can be selected from 1 200 bps, 2 400 bps, 4 800 bps, 9 600 bps, 19 200 bps and 38 400 bps
Data bit length	Can be selected from 7 bit and 8 bit
Parity bit	Can be selected from No parity, Even parity and Odd parity
Stop bit	Can be selected from 1 bit and 2 bit
Terminator	Can be selected from CR+LF and CR
Transmission data	ASCII code
Cable length	About 1 km
Address	Can be selected from [0] to [31]
Number of connected units	32 units maximum (1 unit in stream mode)

Note:

The standard RS-232C interface and optional communication by RS-232C interface, RS-422 interface and RS-485 interface are not interlinked.

16.2 Data format

Refer to Chapter 17.5 for the data format.

16.3 Switch to standard RS-485 interface setting change screen

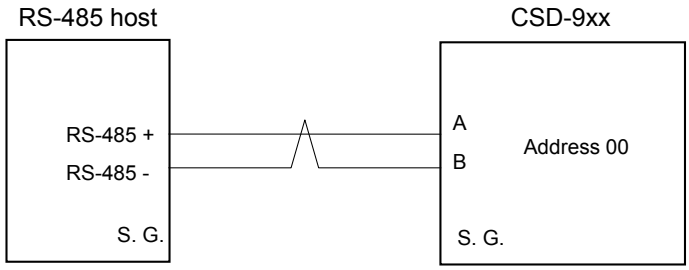
1. Select [MENU].
2. Select [BUILT-IN SERIAL I/F] in menu screen 1/2.
3. Select [RS-485] in the standard communication setting screen.

16.4 Setting item of standard RS-485 communication

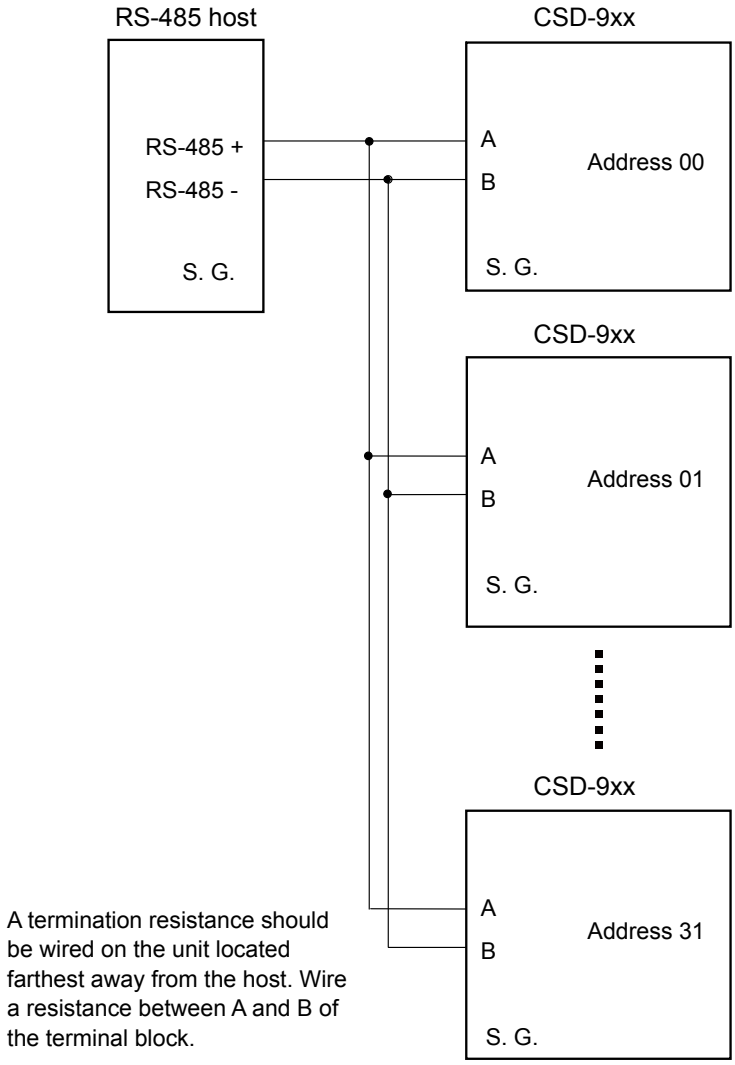
1	Operation mode The operation mode is selectable from [COMMAND MODE] or [STREAM MODE]. [COMMAND MODE] is selected as default. **Note:** When stream mode is selected, the message of [DATA OUTPUT BY A CONSTANT INTERVAL CONTINUES IN STREAM MODE.THEREFORE, CONTROL BY THE HOST BECOMES IMPOSSI] is appeared. Tap [YES] to select.
2	Baud rate Baud rate is selectable from [1 200 bps], [2 400 bps], [4 800 bps], [9 600 bps], [19 200 bps] or [38 400 bps]. [9 600 bps] is set as default.
3	Data bit length The bit length of the output data is selectable from [7 bit] or [8 bit]. [8 bit] is selected as default.
4	Parity The parity bit is selectable from [none], [Odd number] and [Even number]. [Odd number] is selected as default.
5	Stop bit The stop bit is selectable from [1 bit] or [2 bit]. [1 bit] is selected as default.
6	Terminator The terminator is selectable from [CR] or [CR+LF]. [CR+LF] is selected as default.
7	Addition of decimal point The addition of decimal point is selectable from [None] or [Existing]. [None] is set as default.
8	Address The address going to communicate is set. The address is input with the ten keys within the range from 0 to 31. [0] is set as default.
9	Data delay time of RS-485 interface The data delay time when communicating with RS-485 interface is set. After the host side transmission is finished, the return data of CSD-918 side can be delayed in the case that sending terminal on the host side becomes the condition of low impedance. The time is input with the ten keys in the range from 0.00 to 9.99. [0.01] is set as default.
10	Target output of stream mode Data output at the time of stream mode is selectable from [LOAD DISPLAY], [GROSS], [NET] or [LOAD DISP. WITH STATE]. [LOAD DISPLAY] is selected as default.

16.5 Connecting method

16.5.1 One to one



16.5.2 One to N



A termination resistance should be wired on the unit located farthest away from the host. Wire a resistance between A and B of the terminal block.

Note:

- Connect the S.G. terminal if necessary, depending on communication status with the host.
- The polarity of the host computer signal may be reversed depending on the unit.
- There may be no S.G. terminal on the host side.
- Connect with twisted pair cables.
- The S.G of the standard RS-485 interface is connected to the internal common.

17 Options

17.1 Analog output (ANALOG OUTPUT)

17.1.1 Current output specifications (model: CSD-918-P07)

Specification	Content
Output	4 mA DC to 20 mA DC
Load resistance	510 Ω or less
Non linearity	Within 0.02 % F. S.
Resolution	1/12 000 or more
Over range	[-OL] displayed at approx. 2.4 mA DC [OL] displayed at approx. 21.6 mA DC
Output rate	Synchronized with the A/D sampling rate.

17.1.2 Voltage output specifications (model: CSD-918-P25)

Specifications	Content
Output	0 V DC to 10 V DC
Load characteristics	5 kΩ or more
Non linearity	Within 0.02 % F. S.
Resolution	1/12 000 or more
Over range	[-OL] displayed at approx. -1 V [OL] displayed at approx. 11 V
Output rate	Synchronizes with the A/D sampling.

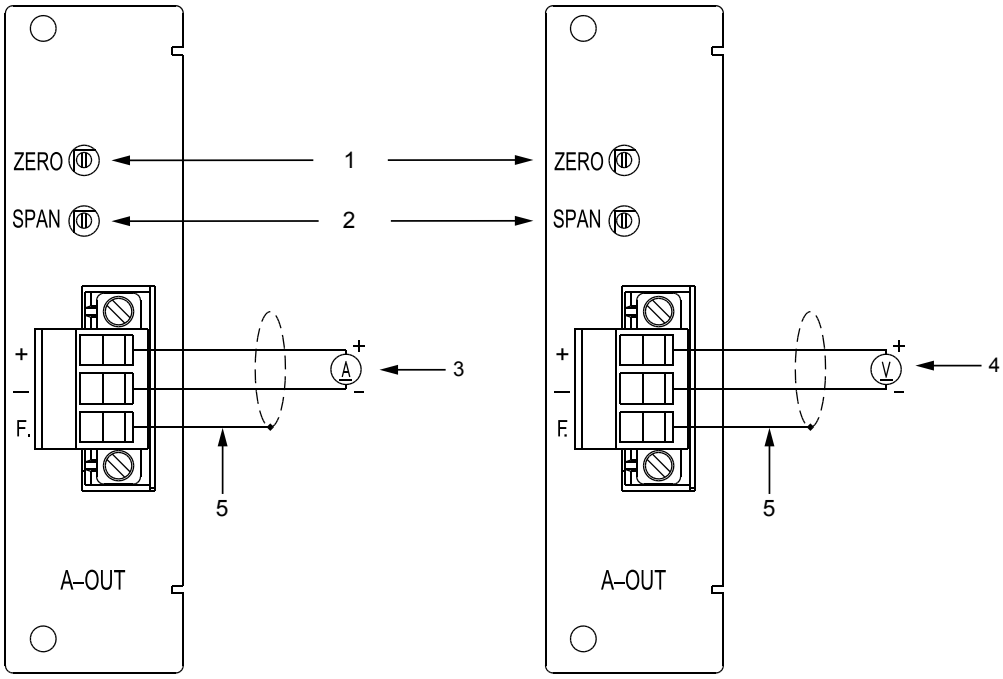
Note:

- The internal circuit is insulated with optocoupler.
- After turning on the power supply, the analog output has the output variable factor.

  Please turn on the power supply for about one hour before to use it in stable condition.

17.1.3 Connection of analog output

Current output **Voltage output**



Applicable plug: MSTB_2.5/3-STF.5.08 (by PHOENIX CONTACT)

Pos.	Description
1	Zero fine calibration trimmer
2	SPAN fine calibration trimmer
3	Load resistance ≤510 Ω
4	Load resistance ≥5 kΩ
5	Screen

Note:

- Strip back the cable tip 7 mm
- The tightening torque of terminal screws on the terminal board is 0.6 N·m.
- The connecting cable must be AWG28 to AWG16.
- Use shielded cable and connect the shield to the F.G. terminal

17.1.4 Switch to analog output setting screen

Switch from the weighing screen to the analog output setting screen by the following procedure.

1. Select [MENU].
2. Tap [NEXT].

3. Select [OPTION].
4. Select [ANALOG OUTPUT].

17.1.5 Selection of target of analog output

The target of analog output is selected.

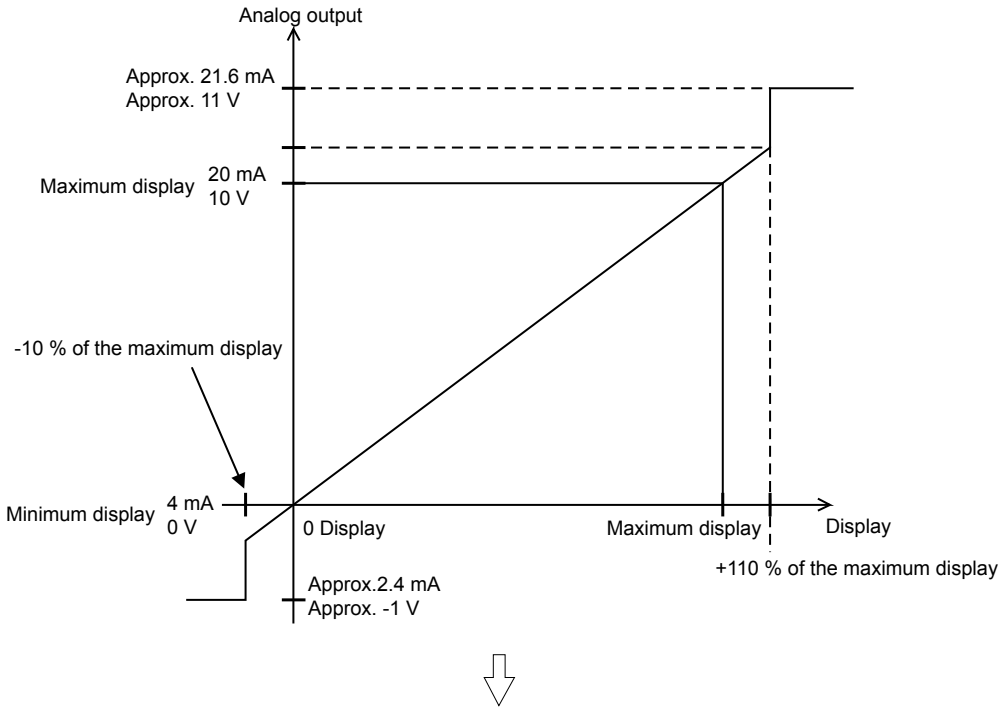
It is selectable from [LOAD DISPLAY], [GROSS] or [NET].

[LOAD DISPLAY] is selected as a default.

17.1.6 Scaling of analog output

The analog output is input with ten keys in the range from -999 999 to 999 999 to the minimum value to maximum value in every [1] digit.

Set this as an optional value by switching from [ZERO OUTPUT] to[SPAN OUTPUT].



Note:

Equalize the scaling and output targets when a current output and a voltage output are used synchronously.

(Fine calibration can be made to each output.)

The display when the minimum value of output is set to [ZERO OUTPUT].

The display when the maximum value of output is set to [SPAN OUTPUT].

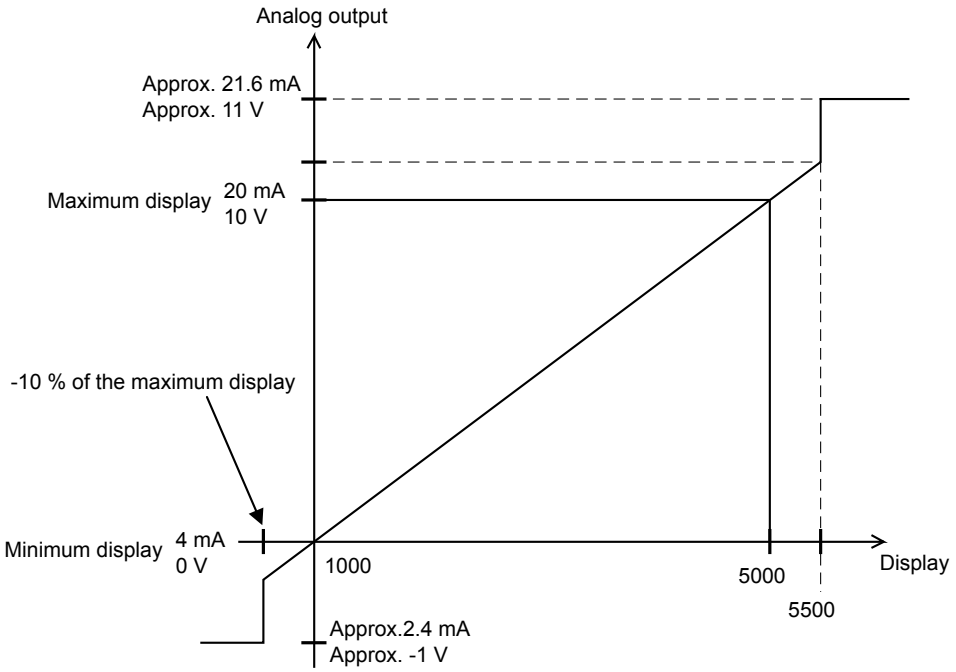
Example:

[ZERO OUTPUT]: Set to 1 000.

[SPAN OUTPUT]: Set to 5 000.

Outputs maximum value at a display of 5 000.

Outputs minimum value at a display of 1 000.



Note:

- The setting of [SPAN OUTPUT] must not exceed the max. load (Max), as described in Chapter 6.
- Set [ZERO OUTPUT] to a lower value than [SPAN OUTPUT].
- Equalize the scaling and output targets when a current output and a voltage output are used synchronously.

  Fine calibration can be made to each output.

17.1.7 Analog output fine calibration

After setting the scaling of analog output by [ZERO OUTPUT] and [SPAN OUTPUT], proceed the fine calibration with the zero trimmer and the SPAN trimmer.

The fine calibration range is approx. ±1 % of full scale.

17.2 BCD output

17.2.1 Specifications (model CSD-918-P15)

The BCD output specifications are given below.

Specifications	I/O	Content
BCD data	Output	8 digit parallel output
POL. (polarity)	Output	ON with the minus polarity output, and OFF with the plus polarity output.
P.C. (print command)	Output	ON in fixed time after conversion of BCD output is completed.

Specifications	I/O	Content
ERROR (error)	Output	ON when an error occurs For error descriptions, refer to Chapter 19.2.1 and 19.2.3.
OVER	Output	ON synchronizing with the OL display (overload).
Decimal point 10^1, decimal point 10^2, decimal point 10^3, decimal point 10^4	Output	ON synchronizing with the decimal point display setting.
Stable	Output	ON when stability is detected
Gross weight	Output	ON when the BCD output is gross weight.
HOLD	Input	Holding of BCD output
BCD-ENABLE	Input	The output related to BCD is compulsorily set to high impedance.
Numbers which can be equipped	-	Up to 2 units. When two units are mounted, both of two units are the same operation.

17.2.2 Switch to BCD output setting screen

Switch from the weighing screen to the BCD output setting screen by the following procedure.

1. Select [MENU].
2. Tap [NEXT].
3. Select [OPTION].
4. Select [BCD OUTPUT].

17.2.3 Setting item of BCD output

1	Operation mode The BCD output mode is selectable from [Stream], [SYNC. WITH PRINT], [SYNC. WITH ACCUM] or [SYNC.WITH FINISH]. [STREAM] is set as default.
2	Target of output The target of BCD output is selectable from [LOAD DISPLAY], [Gross weight], [Net weight], [Tare weight], [BRAND ACCUM.AMOUNT] or [BRAND ACCUM. COUNT]. [LOAD DISPLAY] is set as default.
3	BCD output logic The logic of the BCD output is selectable from [Negative logic] or [Positive logic]. [Negative logic] is set as default.
4	POL. (polarity) Logic The output logic of POL is selectable from [Negative logic] or [Positive logic]. [Negative logic] is set as default.

5	ERROR flag logic The logic of the error output is selectable from [Negative logic] or [Positive logic]. [Negative logic] is set as default.
6	P.C. (print command) Logic The logic of P.C. output is selectable from [Negative logic] or [Positive logic]. [Negative logic] is set as default.
7	P.C. (print command) width The data width of P.C. output is selectable from [125 ms], [25 ms] or [5 ms]. [125 ms] is set as default.
8	BCD output times The numbers of BCD output times is selectable from [100 times/s], [20 times/s] or [4 times/s]. [4 times/s] is set as default.

Note:

- Before and after starting up the print command, BCD output becomes unstable due to the conversion of BCD data.
- Please read the correct BCD data at the timing of the falling of the print command.
- The internal circuit is insulated with optocoupler.

17.2.4 Pin assignment of the BCD output

The BCD output are divided into two with the setting of [Output target].

At the time of setting load display, gross weight, net weight and tare weight			
A1	1×10^0	B1	2×10^0
A2	4×10^0	B2	8×10^0
A3	1×10^1	B3	2×10^1
A4	4×10^1	B4	8×10^1
A5	1×10^2	B5	2×10^2
A6	4×10^2	B6	8×10^2
A7	1×10^3	B7	2×10^3
A8	4×10^3	B8	8×10^3
A9	1×10^4	B9	2×10^4
A10	4×10^4	B10	8×10^4
A11	1×10^5	B11	2×10^5
A12	4×10^5	B12	8×10^5
A13	ERROR	B13	N. C.

At the time of setting load display, gross weight, net weight and tare weight			
A14	STABLE	B14	Gross weight
A15	Decimal point 10^1	B15	Decimal point 10^2
A16	Decimal point 10^3	B16	Decimal point 10^4
A17	OVER	B17	POL.
A18	P. C.	B18	HOLD
A19	COM 4	B19	COM. 4
A20	BCD-ENABLE	B20	F. G.

At the time of setting the accumulation value and accumulation count			
A1	1×10^0	B1	2×10^0
A2	4×10^0	B2	8×10^0
A3	1×10^1	B3	2×10^1
A4	4×10^1	B4	8×10^1
A5	1×10^2	B5	2×10^2
A6	4×10^2	B6	8×10^2
A7	1×10^3	B7	2×10^3
A8	4×10^3	B8	8×10^3
A9	1×10^4	B9	2×10^4
A10	4×10^4	B10	8×10^4
A11	1×10^5	B11	2×10^5
A12	4×10^5	B12	8×10^5
A13	1×10^6	B13	2×10^6
A14	4×10^6	B14	8×10^6
A15	1 x 107	B15	2×10^7
A16	4×10^7	B16	8×10^7
A17	OVER	B17	POL.
A18	P. C.	B18	HOLD
A19	COM. 4	B19	COM. 4
A20	BCD-ENABLE	B20	F. G.

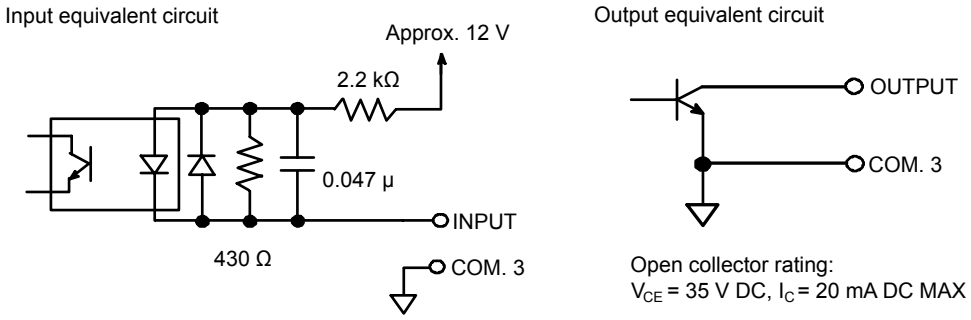
Applicable plug: Main body FCN-361J040-AU and cover FCN-360C040-B(by Fujitsu)

Note:

- Do not connect with the N.C. pin.
- The internal circuit is insulated by optocoupler.
- The output is turned off except for the weighing mode.
- When this unit is conformed to CE mark applicable, connect the screen with F.G. terminal of BCD output.

17.2.5 I/O equivalent circuits

The I/O equivalent circuits for the BCD output are given below.

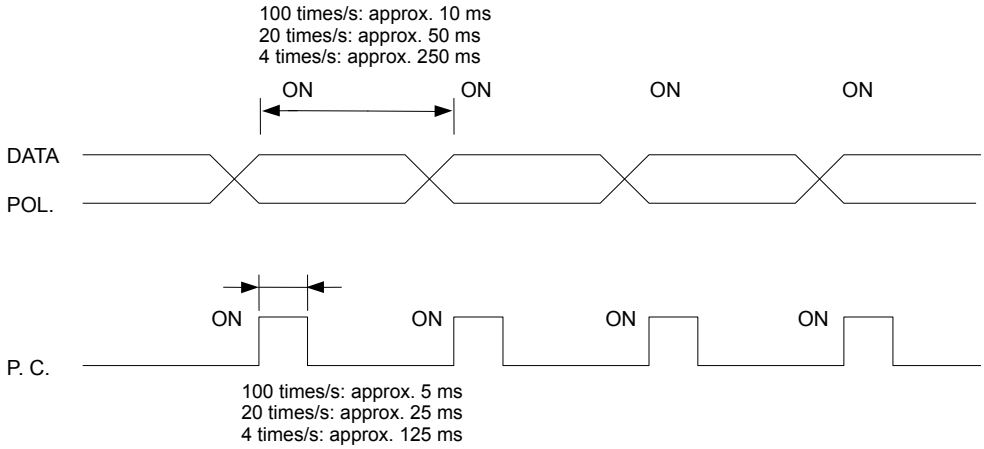


An internal circuit is insulated by optocoupler.

17.2.6 Timing chart

The following chart shows the BCD output timing.

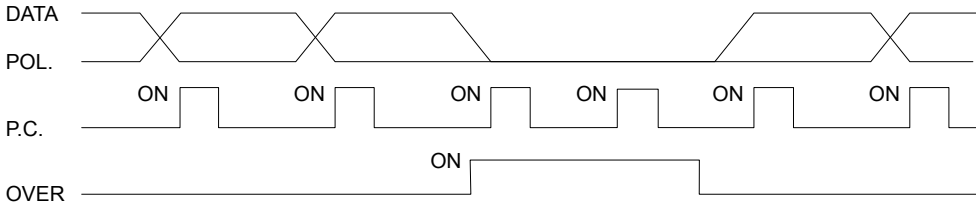
Example 1: Normal



Note:

When P.C., DATA and POL. are all output, the output transistor switch turns ON (negative logic).

Example 2: Data overload status

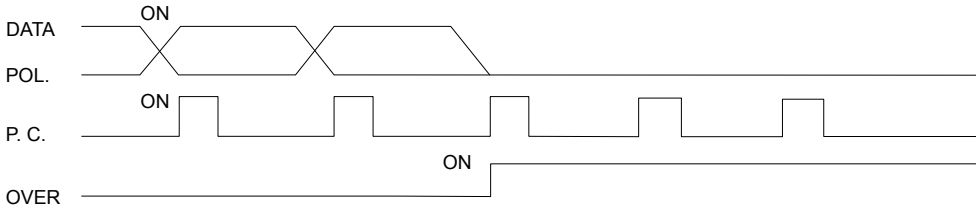


Note:

- When OVER data is output, the OVER signal output transistor turns ON (negative logic).
- When OVER data is output, the OVER signal output transistor turns OFF (positive logic).

  (However, POL turns OFF during positive overload and turns ON during negative overload.)

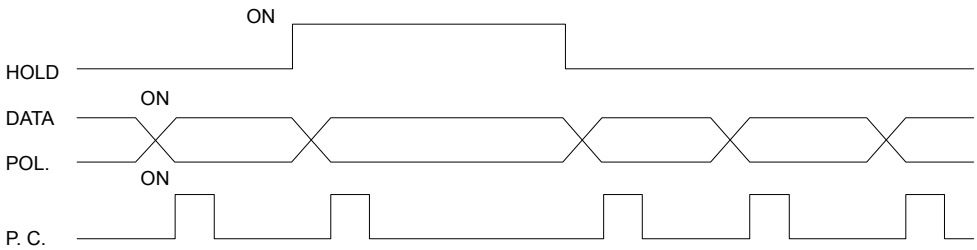
Example 3: When an error occurs



Note:

- When ERROR is output, the ERROR signal output transistor turns ON (negative logic).
- When ERROR is output, all DATA and POL. output transistors turn OFF (positive logic).

Example 4: When the HOLD signal is input



When the HOLD signal is input, the P.C. output transistor turns OFF (positive logic).
The P.C. HOLD signal turns OFF after one-shot operation.

Note:

- HOLD signal input operation is executed after a bridge of 50 ms or more.
- When two BCD outputs are installed, both units are synchronized with the HOLD signal of one of the two signals.

17.2.7 Output state

Output logic setting	Output data	Transistor state	Pin-to-COM level when an external voltage is applied
Negative logic	Yes	ON	L
	None	OFF	H
Positive logic	Yes	OFF	H
	None	ON	L

17.3 RS-232C interface

17.3.1 Specifications (model: CSD-918-P74)

Specifications for the RS-232C interface are given below.

Specification	Description
Transmission method	Half duplex
Synchronous method	Start-stop synchronization
Baud rate	Selectable from 1 200 bps, 2 400 bps, 4 800 bps, 9 600 bps, 19 200 bps, 38 400 bps.
Data bit length	Selectable from 7 bit or 8 bit.
Parity bit	Selectable from no parity, even parity, or odd parity.
Stop bit	Selectable from 1 bit or 2 bit.
Terminator	Selectable from CR+LF or CR.
Sending data	ASCII code
Cable length	Within 15 m
I/O monitor	With LEDs (TXD, RXD)

Note:

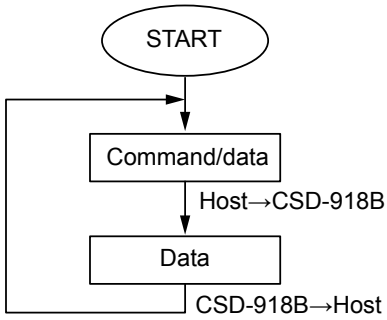
- The standard RS-485 interface and optional communication by RS-232C interface, RS-422 interface and RS-485 interface are not interlocked each other.

17.3.2 Switch to RS-232C interface setting screen

Switch from the weighing screen to the RS-232C interface setting screen by the following procedure.

1. Select [MENU].
2. Tap [NEXT] in menu screen 1/2.
3. Select [OPTION] in the menu screen 2/2.
4. Select [RS-232C] communication set key on optional setting screen.

17.3.3 Operation mode of RS-232C interface

1	Command mode By sending the command/data fixed with the Host (PC, sequencer, etc.) to CSD-918B, the data corresponding to the command/data is send back from the CSD-918B to the Host side from. Be sure to make communication according to the following procedure. 
2	Stream mode This mode keeps outputting the latest data set with the target of output. However, the output frequency changes depending on the setting of display frequency and baud rate.
3	Print signal synchronization The data set with output target is output synchronizing with the print signal (External control input (PRINT COMMAND), Automatic print) (refer to Chapter 9.15.
4	Accumulation (ACCUM) signal synchronization The data set with output target is output synchronizing with the accumulation signal.
5	FINISH signal synchronization The data set with output target is output synchronizing with the FINISH signal.

17.3.4 Setting Item of RS-232C interface

1	Operation mode The operation mode of the RS-232C communication can be selected from the [COMMAND MODE], the [STREAM MODE], [SYNC. WITH PRINT], [SYNC. WITH ACCUM] and [SYNC. WITH FINISH]. Default has selected as the [COMMAND MODE]. **Note:** When stream mode is selected, the message of [DATA OUTPUT BY A CONSTANT INTERVAL CONTINUES IN STREAM MODE.THEREFORE, CONTROL BY THE HOST BECOMES IMPOSSI] appears. Tap [YES] to select.

2	Target of stream and print output The data output when stream mode and the print signal are synchronized is selectable from [LOAD DISPLAY], [GROSS], [NET] or [LOAD DISP. WITH STATE]. [LOAD DISPLAY] is set as default.
3	Baud rate The baud rate is selectable from [1 200 bps], [2 400 bps], [4 800 bps], [9 600 bps], [19 200 bps] or [38 400 bps]. [9 600 bps] is set as default.
4	Data bit length The bit length of output data is selectable from [7 bit] or [8 bit]. [7 bit] is selected as default.
5	Parity The setting of parity bit is selectable from [None], [Odd number] or [Even number]. [Odd number] is selected as default.
6	Stop bit The setting of stop bit is selectable from [1 bit] or [2 bit]. [1 bit] is selected as default.
7	Terminator The setting of terminator is selectable from [CR] or [CR+LF]. [CR+LF] is selected as default.
8	Decimal point addition The decimal point addition for the output data is selectable from [None] or [Yes]. [None] is selected as default.

Note:

- The communicating operation is used in measurement mode only. The error command is sent in other modes.
- The flow control has not made in CSD-918.
- The CTS/RTS signal is not used.
- X flow control is not processed.
- The communicating operation is an interactive mode.

17.3.5 Pin assignment of the RS-232C interface

Pin assignment of the RS-232C interface is given below.

Pin number	Signal name
1	CD
2	TXD
3	RXD
4	N. C.
5	S. G.
6	N. C.

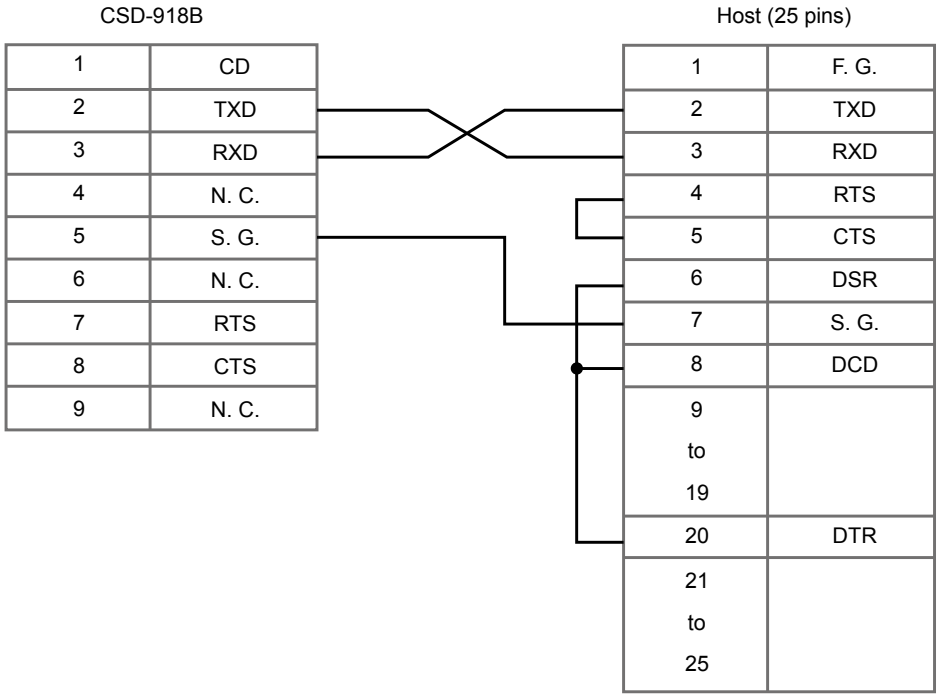
Pin number	Signal name
7	RTS
8	CTS
9	N. C.

Plug: DE-9S-NR (JAE) or equivalent (not included)

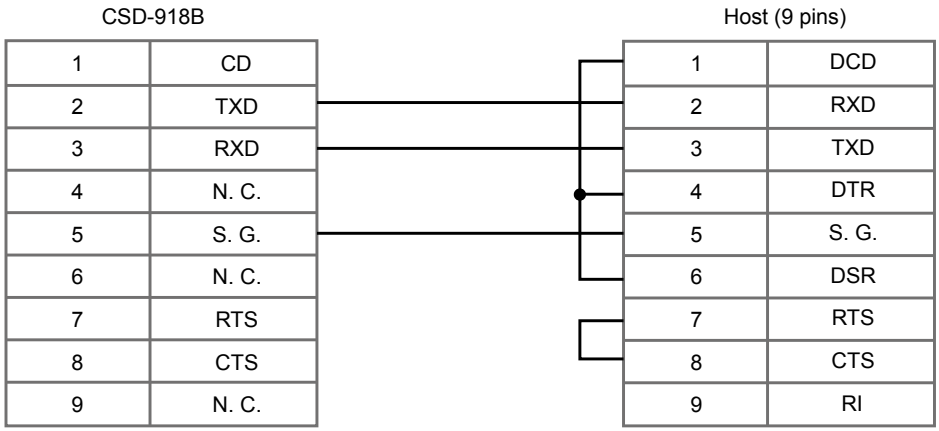
Note:

- The screws for the fixing base of plug at the connector of RS-232C interface is inch type screw.
- Do not connect with N.C. pin.
- The internal circuit is insulated by optocoupler.
- In case of conforming CE mark applicable, please make sure to use shielded cables and connectors attached metallic shells then shield and connector's metallic shell parts are attached directly.

Wiring example 1:



Wiring example 2:



17.4 RS-422/485 interface

17.4.1 Specifications (model: CSD-918-P76)

Specifications for the RS-422/485 interface are given below.

Specification	Description
Transmission method	Half duplex
Synchronous system	Start-stop synchronization
Baud rate	Selectable from 1 200 bps, 2 400 bps, 4 800 bps, 9 600 bps, 19 200 bps, 38 400 bps.
Data bit length	Selectable from 7 bit or 8 bit.
Parity bit	Selectable from no parity, even parity, or odd parity.
Stop bit	Selectable from 1 bit or 2 bit.
Terminator	Selectable from CR+LF or CR.
Transmission data	ASCII code
Cable length	Approx. 1 km or less
Address	One is selected from [0] to [31].
Number of connections	The maximum 32 sets (10 sets with the RS-422. Only one unit in the stream mode.)
Termination	Build-in type. (Selectable from [Yes] or [None] with the terminal board connection.)
I/O monitor	With LEDs
Switch of RS-422 and RS-485	RS-422 and RS-485 interface is selectable by switch setting.

Note:

The standard RS-485 interface and the optional communications of RS-232C interface, RS-422 interface and RS-485 interface are not interlocked each other.

17.4.2 Switch to RS-422/485 interface setting screen

Switch from the weighing screen to the RS-422/485 interface setting screen by the following procedure.

1. Select [MENU].
2. Tap [NEXT] in menu screen 1/2.
3. Select [OPTION] in menu screen 2/2.
4. Select [RS-422/485] in the optional setting screen.

17.4.3 Operation of RS-422/485 interface

Operation is fixed to [COMMAND MODE].

17.4.4 Setting item of RS-422/485 interface

1	Baud rate Baud rate is selectable from [1 200 bps], [2 400 bps], [4 800 bps], [9 600 bps], [19 200 bps] or [38 400 bps]. [9 600 bps] is set as default.
2	Data bit length The bit length of output data is selectable from [7 bit] or [8 bit]. [7 bit] is selected as default.
3	Parity The setting of the parity bit is selectable from [None], [Odd number] or [Even number]. [Odd number] is selectable.
4	Stop bit The setting of stop bit is selectable from [1 bit] or [2 bit]. [1 bit] is selectable.
5	Terminator The terminator's setting is selectable from [CR] or [CR+LF]. [CR+LF] is set as default.
6	Decimal point addition The addition of the decimal point is selectable from [None] or [Yes]. [None] is set as default.
7	Address The address to make communication is set. The address is input with ten keys in the range from 0 to 31. [0] is set as default.
8	Switch of RS-422/485 The communication method is selectable from [RS-422] or [RS-485]. [RS-422] is set as default.

9 RS-485 data delay time
The data delay time while communicating with RS-485 is set.
After transmission is finished from the host side, and the sending terminal becomes low impedance at the host side, you can delay the return data at the side of CSD-918B.
The time is input with ten keys in the range from 0.00 to 9.99 in every [0.01 second].
[0.01] is set as default.

10 Operation mode
The operation mode of RS-422/485 is selectable from [COMMAND MODE] or [STREAM MODE]. [COMMAND MODE] is selected as default.

Note:
When stream mode is selected, the message of [DATA OUTPUT BY A CONSTANT INTERVAL CONTINUES IN STREAM MODE.THEREFORE, CONTROL BY THE HOST BECOMES IMPOSSI] appear, tap [YES] to select.

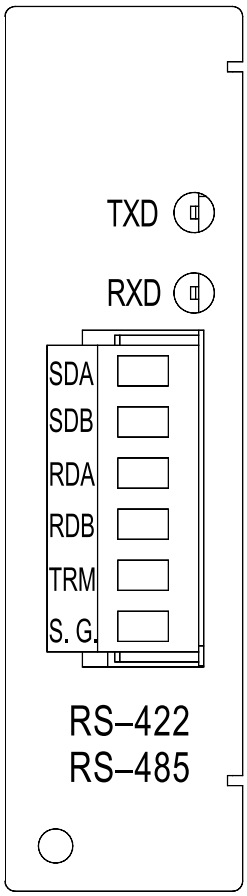
11 Target output of stream mode
Data outputted in stream mode is selectable from [LOAD DISPLAY], [GROSS], [NET] or [LOAD DISP. WITH STATE].
[LOAD DISPLAY] is selected as default.

Note:

- The communicating operation is used for the measurement mode only. The error command is sent in other modes.
- The flow control is not applied inCSD-918.
- The CTS/RTS signal is not used.
- X flow control is not processed.
- The communicating operation is an interactive mode.

17.4.5 Pin assignment of the 422/485 interface

Pin assignment of the 422/485 interface is given below.



SDA: Differential output (+)

SDB: Differential output (-)

RDA: Differential input (+)

RDB: Differential input (-)

TRM: Termination resistance

S. G. : Signal ground

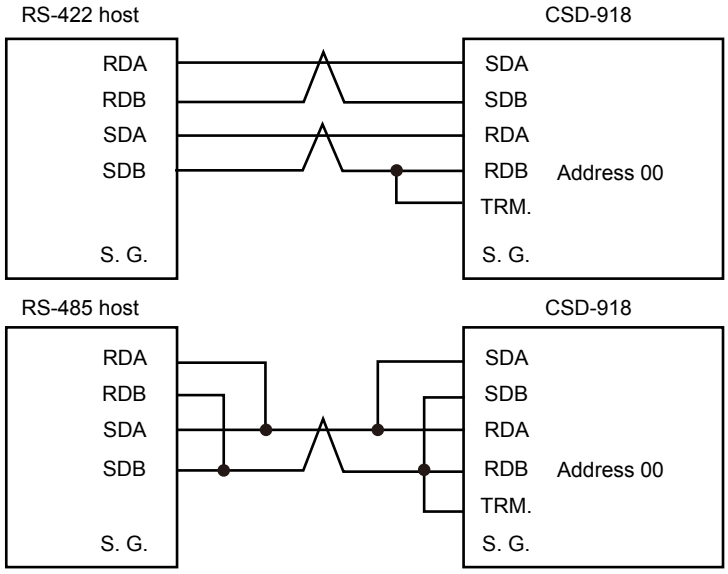
*Applicable plug: XW4B-06C1-H1 (by OMRON)

Note:

- On the unit located farthest from the host, such as a PC or a sequencer, short-circuit the TRM and RDB terminals and wire the internal termination resistance.
- The end of each cable should be stripped 7 mm.
- The terminal block terminal screw tightening torque is 0.6 N·m.
- The wiring cables should be AWG 28 to AWG 16.
- Use twisted pair cables
- The optional parts mounting section is insulated from the internal circuit by a optocoupler.
- The common of optional BCD output and RS-232C interface is connected.
- Connect the cable to the CSD-918 power supply terminal block F.G. terminal to ensure CSD-918 conforms to CE and JIS standards.

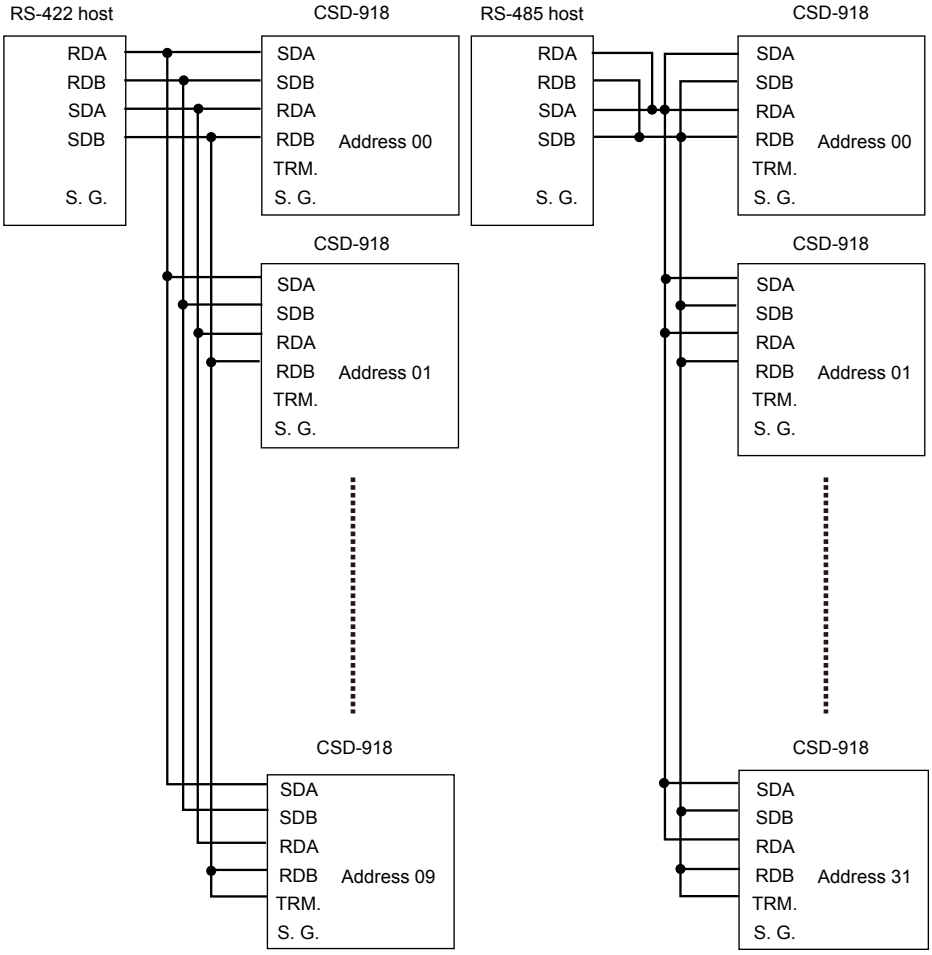
17.4.5.1 Connecting with CSD-918

The procedure to connect the CSD-918 with the RS-422/485 interface is given below.



17.4.5.2 Connecting multiple CSD-918s

The procedure to connect multiple CSD-918s with an RS-422/485 interface is given below.



On the unit located farthest away from the host, TRM and RDB should be short-circuited, and a termination resistance wired.

Note:

- The S.G. terminal is connected if necessary by the state of the communication with the host side.
- The polarity of the signal of the host computer may have an opposite case depending on the instrument.
- Depending on the instrument at host side, there may have the case of no SG terminal.

17.5 RS-232C/422/485 communication data formats

17.5.1 Command mode data formats

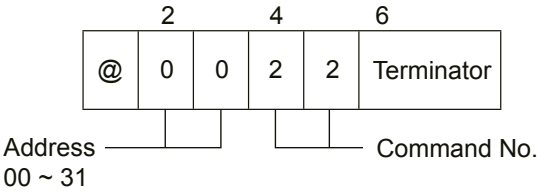
Note:

- The address is fixed to [00] for the application of RS-232C interface.
- Load data is entered from the right end.
- The minus sign ([-]) is entered for all negative values. The plus sign ([+]) is entered for all positive values.
- Zero suppression is applied to load data.
- In the case of overload, [OL] is displayed under load data.
- The blank parts are all spaces.
- When the addition of decimal point is set as [Yes] and the decimal point is specified on the Calibration screen, the decimal point is added to the specified position.

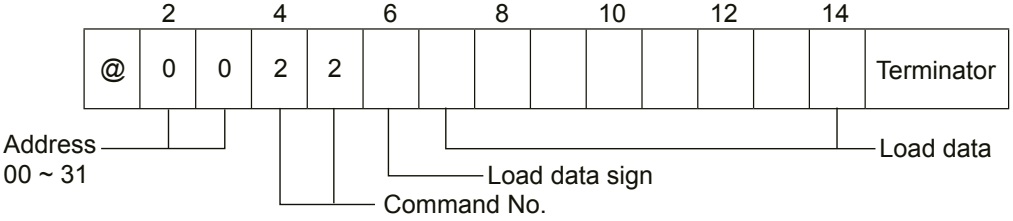
17.5.1.1 Reading out the load data (host → device)

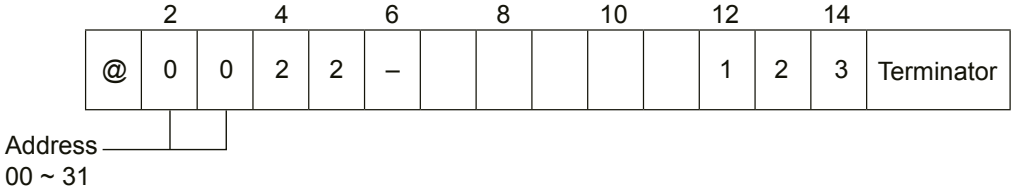
Command No.	Operation
20	Reading load data
21	Reading gross weight
22	Reading net weight
23	Reading tare weight
26	Reading load data with conditions

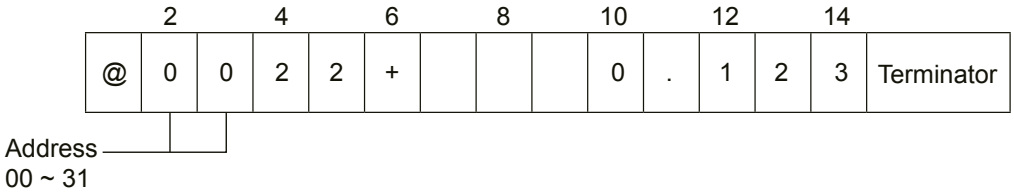
For command Nos. 20 to 23

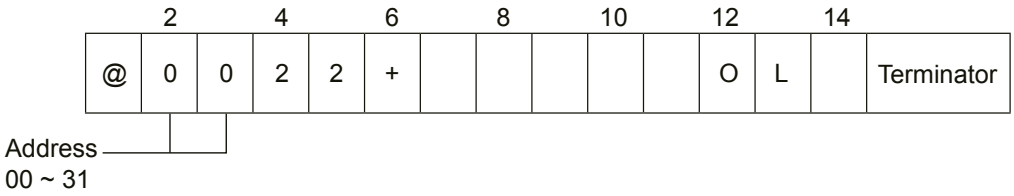


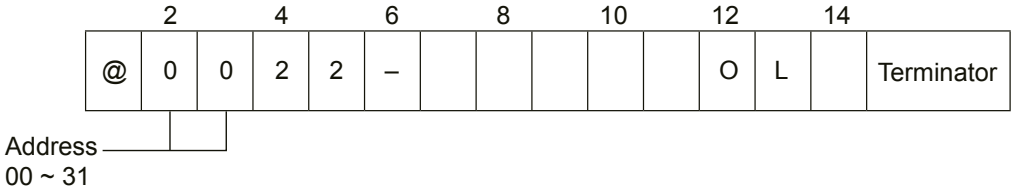
Return (device → Host)



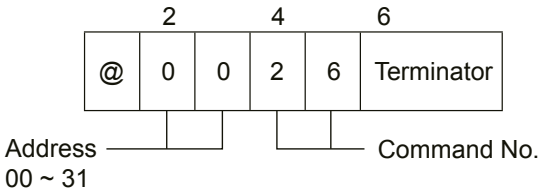




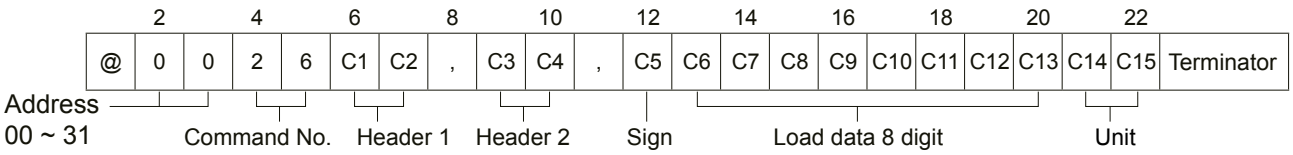




For command No. 26

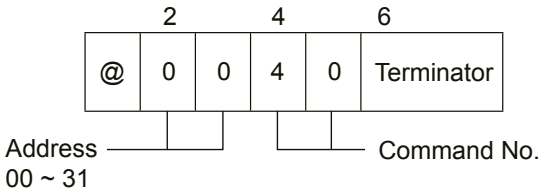


Return (device → Host)

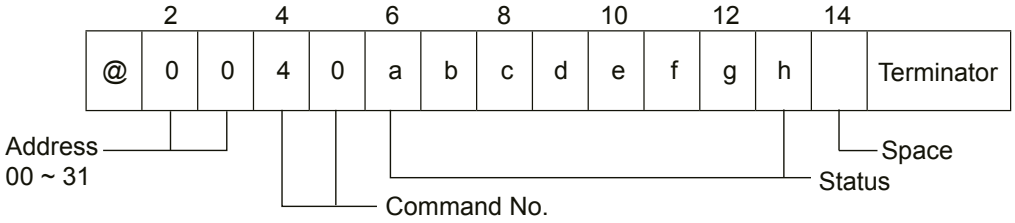


Header 1			Header 2			Sign		Load data (8 digits)								Unit		
C1	C2	Description	C3	C4	Description	C5	Description	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	Description
O	L	Overload	N	T	Net weight	+	Plus						1	2	3		g	Gram
S	T	Stable	G	S	Gross weight	-	Minus				0	.	1	2	3	k	g	Kilogram
U	S	Unstable											O	L			t	Ton
																l	b	Pound
																	N	Newton
																k	N	Kilonewton

17.5.1.2 Reading out condition 1 (Host → device)

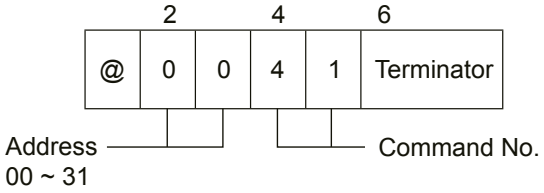


Return (device → Host)

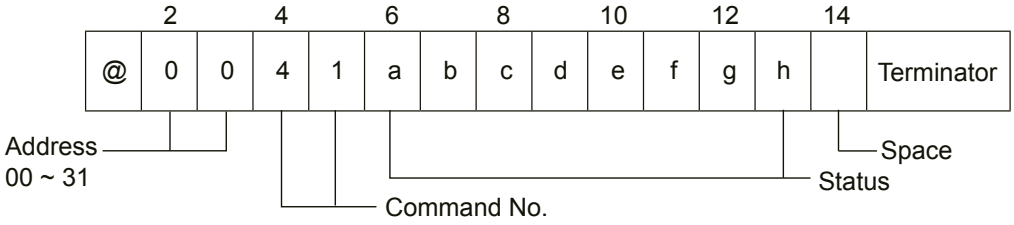


a: Gross weight	b: Net weight
c: Tare	d: Fixed tare
e: Stable	f: HOLD
g: Z-ERR	h: RUN
[1] = ON, [0] = OFF	

17.5.1.3 Reading out condition 2 (Host → device)

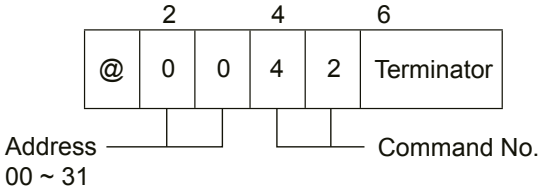


Return (device → Host)

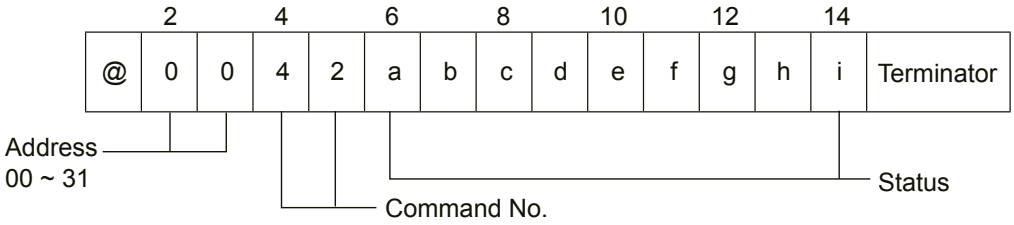


a: F. FLOW	b: M. FLOW
c: D. FLOW	d: OVER
e: OK	f: UNDER
g: FULL	h: ZERO BAND
[1] = ON, [0] = OFF	

17.5.1.4 Reading out condition 3 (Host → device)



Return (device → Host)



a: MIXTURE	b: DISCHARGE (GATE CLOSE)
c: INFLOW FINISH	d: SERVO ERROR
e: DISCHARGE FINISH	f: MIXING FINISH
g: NOZZLE DOWN (INSERT) [1] = ON, [0] = OFF	h: DURING MEASUREMENT
i: WEIGHING SEQ. ERROR	i: Measurement sequence error

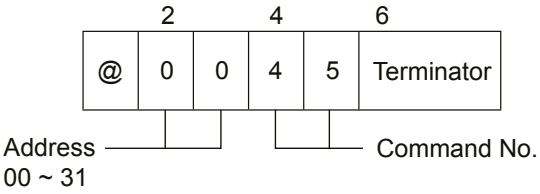
The servo error number 1 to 7 is set in [d].

For information about servo errors, refer to Chapter 19.3.

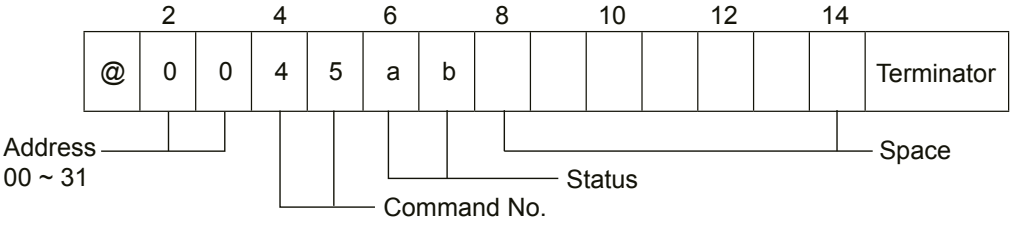
The sequence error number 1 to < is set in [i].

For information about sequence errors, refer to Chapter 19.2.3.

17.5.1.5 Reading out condition 4 (Host → device)

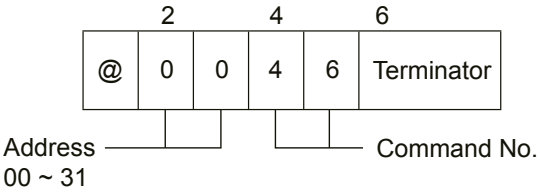


Return (device → Host)

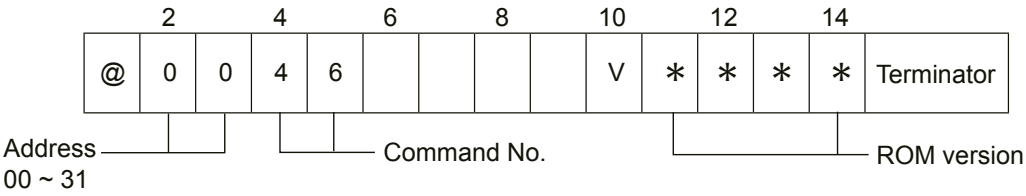


a: Calibration mode	[0] = DURING MEASUREMENT, [1] = DURING ZERO CALIBRATION, [2] = DURING SPAN CALIBRATION
b: Calibration error	[0] = None [1] = Occurrence of ERROR

17.5.1.6 Reading out ROM Version (Host → device)



Return (device → Host)

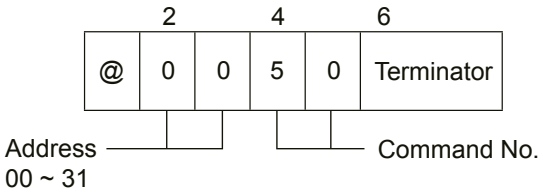


*V1000 indicates ROM version 1.000.

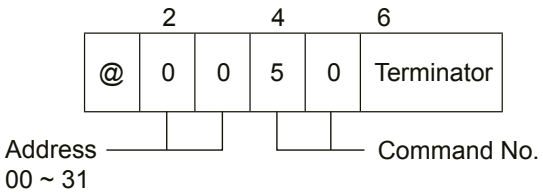
17.5.1.7 Status change (Host → device)

Command No.	Operation
50	GROSS
51	NET
52	ZERO SET
53	ZERO CLEAR

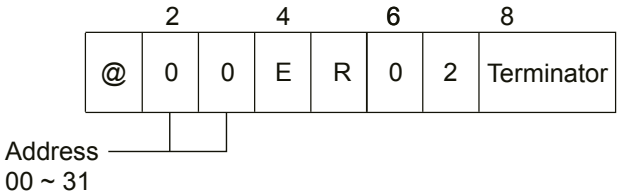
Command No.	Operation
54	TARE
55	TARE CLEAR
56	INFLOW START
57	RECIPE START
58	DISCHARGE START
59	MIXING START
5A	PAUSE
5B	RESTART
5C	ACCUM. COMMAND
5D	FOMER ACM. DATA CLR.
5E	BRAND CODE ACCUM CLR
5F	ALL BRAND CODE ACCUM CLR
5I	ERROR RESET
5J	FORCED BATCH FINISH



Return under normal operation (device → Host)



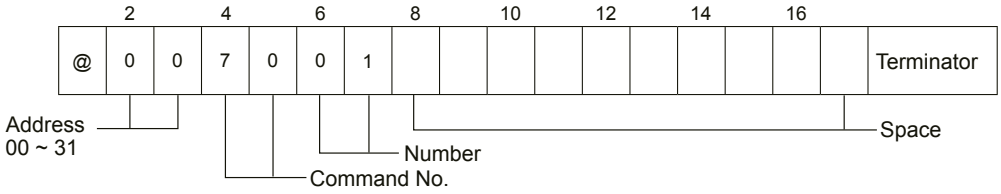
Return under abnormal operation (device → Host)



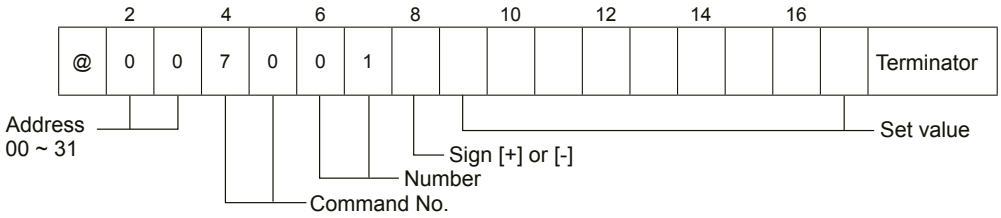
Note:

- The error transmission condition is as follows:
- When executing command No. 51 (net weight display), tare weight is not executed and cannot be changed to net weight.
- When executing command No. 52 (zero set), zero set cannot be executed outwith the effective range.
- When executing command No. 54 (tare weight), tare weight cannot be executed with display ±OL.
- When executing command 5C (ACCUM COMMAND), accumulation cannot be executed due to accumulated value overflow.

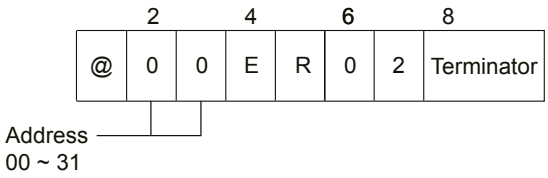
17.5.1.8 Reading out set values (Host → device)



Return under normal operation. (device → Host)



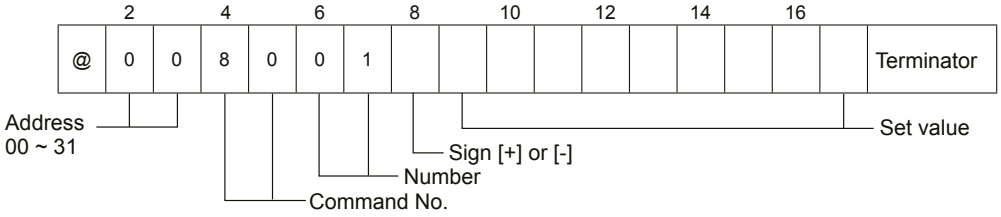
Return under abnormal conditions (when the corresponding number does not exist). (device → Host)



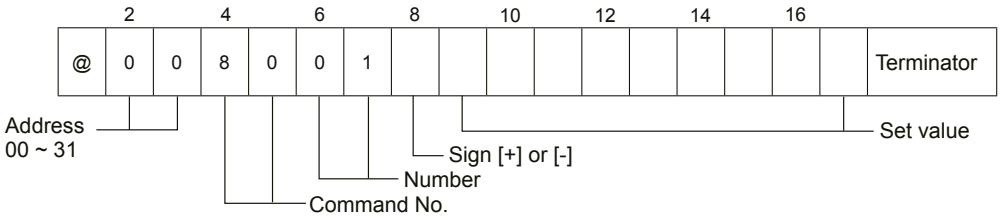
Note:

The setting value is an integer value without a decimal point in the units described in Chapter 20.4.1.12.

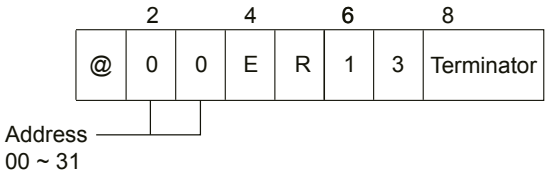
17.5.1.9 Writing set values (Host → device)



Return under normal operation (device → host)



Return under abnormal conditions (For different set value ranges) (device → host)

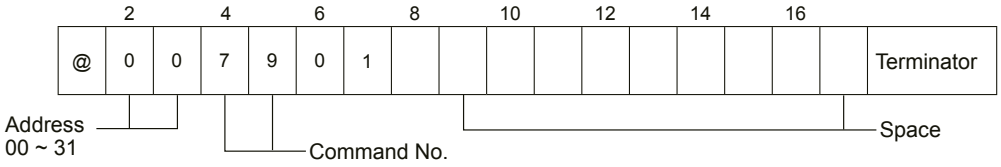


Note:

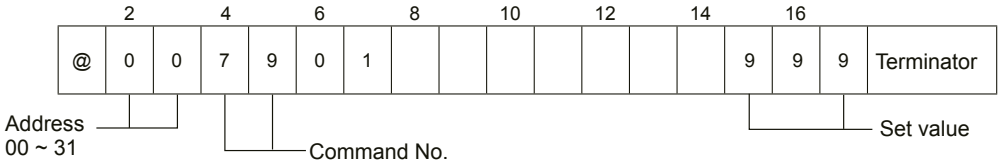
- The command number during write writing changes from [7*,] to [8 *], see Chapter 20.4.1.12.
- The setting value is an integral value without a decimal point in the units described in Chapter 20.4.1.12.

17.5.1.10 Reading out graph display data

Reading weighing time

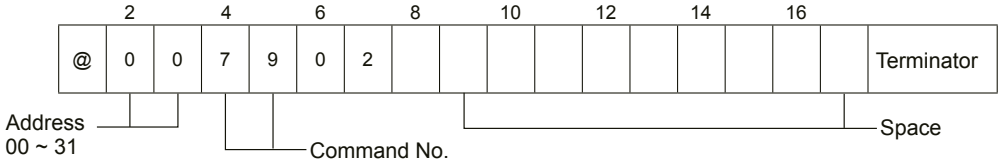


Return

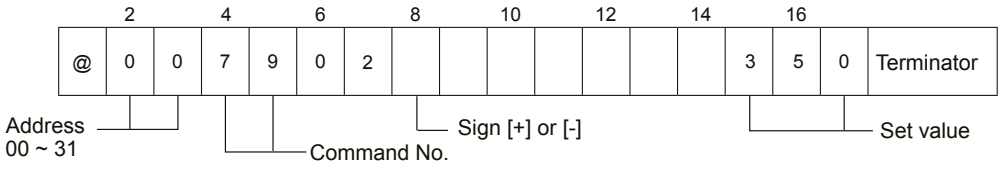


- The unit is fixed to 0.1 second.

Weighing point number

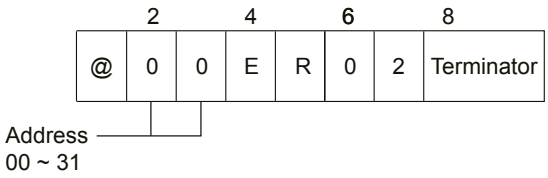


Return (device → Host)

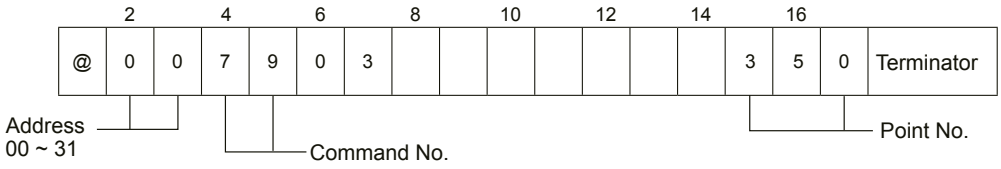


- The range of setting value is from 0 to 350.

Return in abnormal conditions. (device → Host)

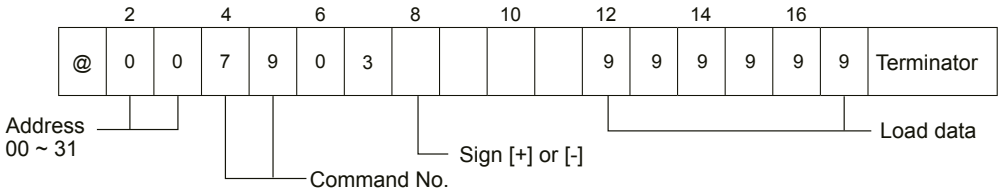


Reading weighing data of weighing point.



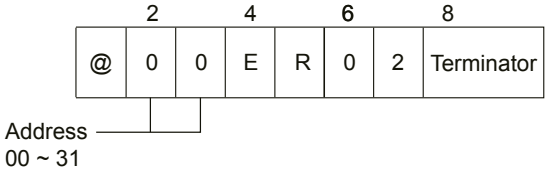
- Point No. range: 0 to 350
- No decimal point is added.

Return under abnormal conditions (device → Host)

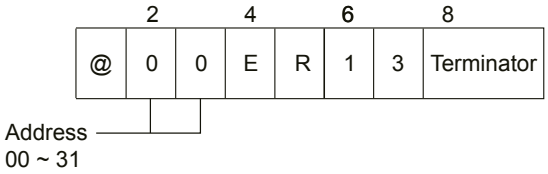


- Setting value range: -999 999 to 999 999
- The setting value is entered from the right for data transmission.
- No decimal point is added.

Return under abnormal conditions (reading during weighing) (device → Host)

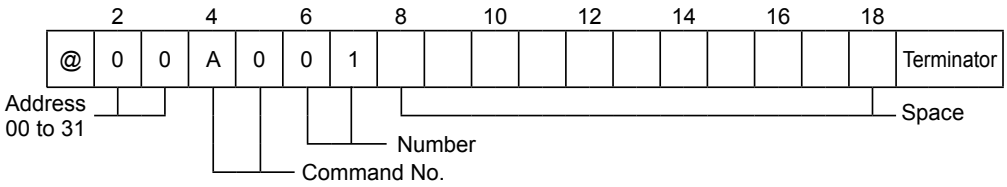


Return under abnormal conditions (read data is greater than weighing points) (device → Host)

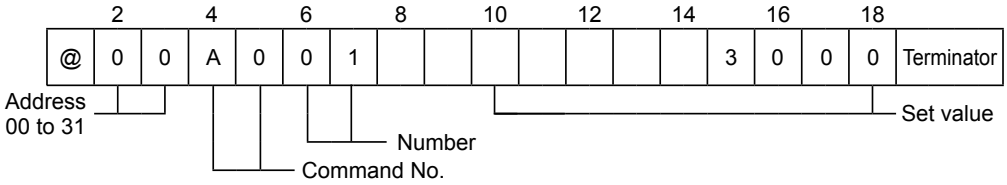


17.5.1.11 Set values for servo calibration, scatter prevention, coarse flow, middle flow and fine flow

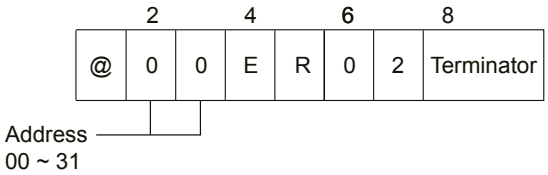
Reading the set value



Return



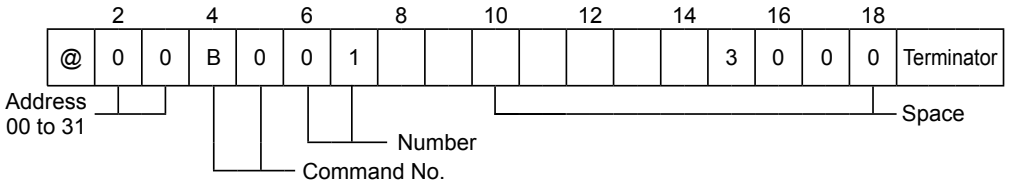
Return under abnormal conditions (reading during measurement) (device → host)



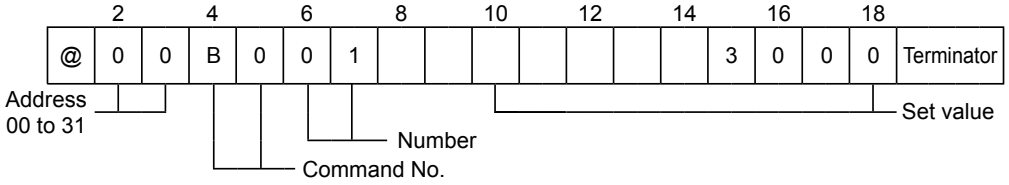
Note:

- The decimal point is not added to set value.
- Values are entered from the right for transmission data

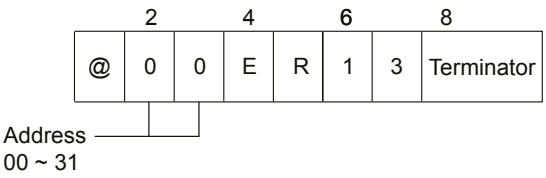
Writing set values



Return



Return under abnormal conditions (For different set value ranges) (device → host)



Note:

- The command number during write writing changes from [7*,] to [8 *], see Chapter 20.4.1.12.
- The setting value is an integral value without a decimal point in the units described in Chapter 20.4.1.12.

Read out commands

Item name	Command name	Command	Number	Return command setting value
BRAND setting	BRAND CODE	70	01	0 to 99
	BRAND NAME	70	02	15 alphanumerical characters
	FINAL	70	04	0 to 999 999
	OVER	70	08	0 to 999 999
	UNDER	70	09	0 to 999 999
	ZERO BAND	70	10	0 to 999 999
	FULL	70	11	0 to 999 999
	A. F.F. COMPENSATION	70	12	0 to 999 999; 0: OFF for A.F.F. COMPENSATION
	SUPPLEMENTARY FLOW (Post-batching) TIME	70	13	0.00 to 99.99 s (Unit: 0.01 s)
	JUDGE. AFTER S-FLOW WAIT	70	14	0.00 to 99.99 s (Unit: 0.01 s)
	BRAND ACCUM TOTAL	70	15	–99 999 999 to 99 999 999

Item name	Command name	Command	Number	Return command setting value
	BRAND ACCUM COUNT	70	16	0 to 999 999
	PRE TARE WEIGHT	70	17	0 to 999 999
	VALID BRAND CODE	70	20	0 to 99
Basic function setting	DISPLAY TIMES	71	01	1: 4 times/s; 2: 20 times/s
	A/D SAMPLING RATE	71	02	1: 10 times/s; 2: 20 times/s; 3: 50 times/s; 4: 100 times/s; 5: 200 times/s; 6: 1 000 times/s
	ANALOG FILTER	71	03	1: [2 Hz]; 2: [4 Hz]; 3: [6 Hz]; 4: [8 Hz]; 5: [10 Hz]; 6: [100 Hz]
	DIGITAL FILTER	71	04	1 to 256 (Unit: times)
	STABILIZATION FILTER	71	05	1 to 256 (Unit: times)
	STAB. FILTER TIME	71	06	0.0 to 9.9 s (Unit: 0.1 s)
	STAB. FILTER BAND	71	07	0.00 to 99.9 (Unit: 0.1 d)
	STAB. DETECTION TIME	71	08	0.0 to 9.9 s (Unit: 0.1 s)
	Stability detection width	71	09	0.00 to 99.9 (Unit: 0.1 d)
	OPERATION OF ZERO	71	10	1: IN STABLE MODE; 2: ANY TIME
	RANGE OF ZERO	71	11	0 to 30 (Unit: %)
	TARGET OF ZERO TRACKING	71	12	1: GROSS/NET WEIGHT; 2: GROSS WEIGHT
	ZERO TRACKING TIME	71	13	0.0 to 9.9 s (Unit: 0.1 s)
	ZERO TRACKING BAND	71	14	0.0 to 9.9 d (Unit: 0.1 d)
	OPERATION OF TARE WEIGHT	71	15	1: IN STABLE MODE; 2: ANY TIME
	RANGE OF TARE WEIGHT	71	16	1: 0 < LOAD ≥ WEIGHING CAPACITY (maximum load); 2: LOAD ≥?WEIGHING CAPACITY (maximum load)?
	OPERATION OF PRESET TARE WEIGHT	71	17	1: EFFECTIVE; 2: INVALID
	PRESET TARE WEIGHT = 0 CHOICE	71	18	1: LAST TARE WEIGHT IS USED; 2: OPERATION OF TARE WEIGHT CLR.
	ZERO AT POWER ON	71	19	1: EFFECTIVE; 2: INVALID
	ZERO CLR. AT POWER ON	71	20	1: EFFECTIVE; 2: INVALID
	TARE WEIGHT AT POWER ON	71	21	1: EFFECTIVE; 2: INVALID
	TARE WEIGHT CLR. AT POWER ON	71	22	1: EFFECTIVE; 2: INVALID
	OPERATION OF HOLD	71	23	1: SYNC.WITH HOLD; 2: SYNC. WITH INFLOW FIN.
	ACCUM COMMAND	71	24	1: 2: IN STABLE MODE; 2: ANY TIME

Item name	Command name	Command	Number	Return command setting value
	PRINT COMMAND	71	25	1: 2: IN STABLE MODE; 2: ANY TIME
	GRAPH TRIGGER MODE (GRAPHIC MODE)	71	26	1: SINGLE; 2: START + LEVEL↑; 3: START + LEVEL↑↓; 4: LEVEL↑; 5: LEVEL↑↓; 6: INFLOW START LINKED
	GRAPH TRIGGER LEVEL	71	27	–999 999 to 999 999
	SELECT OF WEIGHING SCREEN	71	28	1: STANDARD; 2: STANDARD/SIMPLE
	CONDITION OF DETECT STABILITY	71	29	1: ANY TIME; 2: ONLY DETECT IN WEIGHING SCREEN
	HOLD OF COMPARATIVE RESULT	71	31	1: EFFECTIVE; 2: INVALID
	HOLD OF S-I/F	71	32	1: EFFECTIVE; 2: INVALID
	HOLD OF LOAD DISPLAY VALUE	71	34	1: EFFECTIVE; 2: INVALID

Input 15 characters under command setting when using the [BRAND NAME]command

Note:

- The command number during writing changes from [70,] as described in the table, to [80].
- The command number during writing changes from [71,] as described in the table, to [81].

Read out commands

Item name		Command name	Command	Number
I/O setting	F1 to F4 keys	F1 key function	72	02
		F2 key function	72	03
		F3 key function	72	04
		F4 key function	72	05
		Return command setting value		
		1: OFF; 2: PRINT; 3: ZERO CLEAR; 4: TARE WEIGHT CLEAR; 5: INFLOW START; 7: DISCHARGE START; 8: MIXING START; 9: PAUSE; 10: RESTART; 11: FORCED INFLOW FINISH; 13: FORCED DISCH. FINISH; 14: ACCUM COMMAND; 15: CANCEL THE ACM; 16: M.F. F. COMPENSATION; 17: ERR. RESET; 18: CLR. ACM. OF BRAND; 20: CLR ACM. OF ALL BRAND; 22: HOLD		
	I/O input	Command name	Command	Number
		I/O input 1	72	11
		I/O input 2	72	12

Item name	Command name	Command	Number
	I/O input 3	72	13
	I/O input 4	72	14
	I/O input 5	72	15
	I/O input 6	72	16
	I/O input 7	72	17
	I/O input 8	72	18
	I/O input 9	72	19
	I/O input 10	72	20
	I/O input 11	72	21
	Return command setting		
	1: OFF; 2: GROSS/NET WEIGHT; 3: ZERO; 4: ZERO CLEAR; 5: TARE WEIGHT; 6: TARE WEIGHT CLEAR; 7: INFLOW START; 9: DISCHARGE START; 10: MIXING START; 11: CHANGE OF INFLOW/DISCHARGE; 12: MANUAL F-FALL (Overshoot) COMPENSATION; 13: TOTAL COMMAND;14: FOMER ACM. DATE CLR.; 15: Code number 1; 16: Code number 2; 17: Code number 4; 18: Code number 8; 19: Code number 10; 20: Code number 20; 21: Code number 40; 22: Code number 80; 23: PAUSE; 24: RESTART; 25: CLR ACM. OF BRAND; 26: CLR OF ACM. OF ALL BRAND; 29: SAFETY INPUT 1; 30: SAFETY INPUT 2; 31: SAFETY INPUT 3; 32: SAFETY INPUT 4; 33: SAFETY INPUT 5; 34: SAFETY INPUT 6; 35: SAFETY INPUT 7; 36: SAFETY INPUT 8; 37: FORCED INFLOW FINISH; 39: FORCED DISCH. FINISH; 43: MANUAL DISCHARGE; 44: MANUAL MIXING; 45: ERROR RESET; 46: PRINT COMMAND; 47: HOLD; 48: MANUAL CONTROL		

Note:

The command number during writing changes from [72], as described in the table, to [82].

Read out commands

Item name		Command name	Command	Number
I/O setting	I/O output	I/O output 1	72	31
		I/O output 2	72	32
		I/O output 3	72	33
		I/O output 4	72	34
		I/O output 5	72	35
		I/O output 6	72	36
		I/O output 7	72	37
		I/O output 8	72	38

Item name	Command name	Command	Number
	I/O output 9	72	39
	I/O output 10	72	40
	I/O output 11	72	41
	Return command setting		
	1:OFF; 2: STABLE; 3: ZERO BAND; 4: FULL; 5: F. FLOW; 6: M. (Middle) FLOW; 7: D. (Fine) FLOW; 8: OVER; 9: OK; 10: UNDER; 11: MIXING; 12: DISCHARGE (GATE OPEN); 13: INFLOW FINISH; 15: DISCHARGE FINISH; 16: MIXING FINISH; 17: NOZZLE DOWN (INSERT); 18: DURING MEASUREMENT; 19: MEASUREMENT SEQUENCE ERROR; 20: CAP. EXCEEDED ERROR; 21: ERROR; 22: DURING TARE WEIGHT; 23: CENTER OF ZERO; 24: GROSS WEIGHT DISPLAY; 25: NET WEIGHT DISPLAY; 26: DURING HOLD; 77: SERVO ERROR		

Command name	Command	Number	Command name
I/O output logic (OUT1 ~ OUT7)	72	61	1: [Negative logic]; 2: [Positive logic]; 100: I/O OUTPUT1; 101: I/O OUTPUT2; 103: I/O OUTPUT3; 104: I/O OUTPUT4; 105: I/O OUTPUT5; 106: I/O OUTPUT6; 107: I/O OUTPUT7
I/O output logic (OUT8 ~ OUT11)	72	62	1: [Negative logic]; 2: [Positive logic]; 100: I/O OUTPUT 8; 101: I/O OUTPUT 9; 103: I/O OUTPUT 10; 104: I/O OUTPUT 11

Read out commands

Item name	Command name	Command	Number	Return command setting value
I/O setting	Zero key lock	72	51	1: EFFECTIVE; 2: INVALID
	Gross/Net weight key lock	72	52	1: EFFECTIVE; 2: INVALID
	Tara key lock	72	53	1: EFFECTIVE; 2: INVALID
	Brand code key lock	72	54	1: EFFECTIVE; 2: INVALID
	F key lock	72	55	1: EFFECTIVE; 2: INVALID
	Menu key lock	72	56	1: EFFECTIVE; 2: INVALID
	Calibration key lock	72	57	1: EFFECTIVE; 2: INVALID
	Servo CALIB. key lock	72	58	1: EFFECTIVE; 2: INVALID
I/O setting	Control mode	73	02	1: Inflow mode; 2: Discharge mode; 3: External input change
	Comparison signal operation (Operation of Over, OK and Under)	73	03	1: ANY TIME; 2: STABLE; 3: SYNC with inflow finish; 4: HOLD at inflow finish

Item name	Command name	Command	Number	Return command setting value
	ZERO BAND comparison operation	73	04	1: Gross weight; 2: Net weight; 3: COMPARISON OFF; 4: ? GROSS WEIGHT ?; 5: ? NET WEIGHT ?
	Comparative of FULL operation	73	05	1: Gross weight; 2: Net weight; 3: COMPARISON OFF; 4: ? GROSS WEIGHT ?; 5: ? NET WEIGHT ?
	SAVE THE AUTOMATIC FREEFALL (Overshoot)	73	07	1: No MEMORY; 2: MEMORIZE
	INFLOW SAFETY CHECK			
	SAFETY CHECK 1	73	11	1: [ON]; 2: [OFF]
	SAFETY CHECK 2	73	12	1: [ON]; 2: [OFF]
	SAFETY CHECK 3	73	13	1: [ON]; 2: [OFF]
	SAFETY CHECK 4	73	14	1: [ON]; 2: [OFF]
	SAFETY CHECK 5	73	15	1: [ON]; 2: [OFF]
	SAFETY CHECK 6	73	16	1: [ON]; 2: [OFF]
	SAFETY CHECK 7	73	17	1: [ON]; 2: [OFF]
	SAFETY CHECK 8	73	18	1: [ON]; 2: [OFF]
	DISCHARGE SAFETY CHECK			
	SAFETY CHECK 1	73	21	1: [ON]; 2: [OFF]
	SAFETY CHECK 2	73	22	1: [ON]; 2: [OFF]
	SAFETY CHECK 3	73	23	1: [ON]; 2: [OFF]
	SAFETY CHECK 4	73	24	1: [ON]; 2: [OFF]
	SAFETY CHECK 5	73	25	1: [ON]; 2: [OFF]
	SAFETY CHECK 6	73	26	1: [ON]; 2: [OFF]
	SAFETY CHECK 7	73	27	1: [ON]; 2: [OFF]
	SAFETY CHECK 8	73	28	1: [ON]; 2: [OFF]
Weighing operation setting	MIXING SAFETY CHECK			
	SAFETY CHECK 1	73	41	1: [ON]; 2: [OFF]
	SAFETY CHECK 2	73	42	1: [ON]; 2: [OFF]
	SAFETY CHECK 3	73	43	1: [ON]; 2: [OFF]
	SAFETY CHECK 4	73	44	1: [ON]; 2: [OFF]
	SAFETY CHECK 5	73	45	1: [ON]; 2: [OFF]
	SAFETY CHECK 6	73	46	1: [ON]; 2: [OFF]
	SAFETY CHECK 7	73	47	1: [ON]; 2: [OFF]
	SAFETY CHECK 8	73	48	1: [ON]; 2: [OFF]
	Safety condition for all sequences			

Item name	Command name	Command	Number	Return command setting value
	SAFETY CHECK 1	73	51	1: [ON]; 2: [OFF]
	SAFETY CHECK 2	73	52	1: [ON]; 2: [OFF]
	SAFETY CHECK 3	73	53	1: [ON]; 2: [OFF]
	SAFETY CHECK 4	73	54	1: [ON]; 2: [OFF]
	SAFETY CHECK 5	73	55	1: [ON]; 2: [OFF]
	SAFETY CHECK 6	73	56	1: [ON]; 2: [OFF]
	SAFETY CHECK 7	73	57	1: [ON]; 2: [OFF]
	SAFETY CHECK 8	73	58	1: [ON]; 2: [OFF]
	AUTOMATIC ACCUM.	73	61	1: OFF; 2: SYNC WITH FINISH; 3: AUTO ACCUM AT STABLE
	CONDITION OF AUTO ACM.	73	62	1: OK OPERATION; 2: Unconditional
	AUTOMATIC PRINT	73	64	1: EFFECTIVE; 2: INVALID
Sequence control setting	Signal operation of INFLOW start			
	START ABOVE ZERO BAND	74	01	1: EFFECTIVE; 2: INVALID
	AUTOMATIC TARE WEIGHT	74	02	1: EFFECTIVE; 2: INVALID
	NOZZLE OPERATION			
	NOZZLE CONTROL	74	03	1: EFFECTIVE; 2: INVALID
	CONTACT STOP SEQUENCE	74	04	1: EFFECTIVE; 2: INVALID
	UP AFTER COMPENSATION	74	05	1: EFFECTIVE; 2: INVALID
	JUDGMENT CONDITION	74	06	1: After calming time (waiting time); 2: After calming time (waiting time) and stabilization; 3: After calming time (waiting time) or stabilization
	Operation when measurement is complete (INFLOW FINISH ACTIONS)			
	MIXING START	74	07	1: EFFECTIVE; 2: INVALID
	DISCHARGE START	74	08	1: EFFECTIVE; 2: INVALID
	Operation when discharge is complete (DISCHARGE FINISH ACTIONS)			
	TARE WEIGHT CLEAR	74	09	1: EFFECTIVE; 2: INVALID
	MIXING START	74	10	1: EFFECTIVE; 2: INVALID
	MAXTIME OF COMPENSATION	74	15	0 to 255 times; 0: Turn off (Unit: times)

Item name	Command name	Command	Number	Return command setting value
	COMPARISON FLOW EVAL	74	16	1: TIMER IS UP; 2: STAB. AND TIMER IS UP; 3: STAB. OR TIMER IS UP
	A.F.F. COMPENSATION	74	17	1: EFFECTIVE; 2: INVALID
	INFLOW FINISH OUTPUT OFF	74	18	1: NO CONDITION; 2: OL OR UNSTABLE; 3: ZERO BAND
	TARE WEIGHT INFLOW START DELAY	74	21	1: EFFECTIVE; 2: INVALID
	INFLOW MONITORING TIMER	74	22	0 to 9 999 s (Unit: s)
	INFLOW START DELAY TIMER	74	23	0 to 9 999 s (Unit: s)
	F-FLOW (Coarse flow) COMP. STOP TIMER	74	24	0.00 to 99.99 s (Unit: 0.01 s)
	M. FLOW (Middle flow) COMP. STOP TIMER	74	25	0.00 to 99.99 s (Unit: 0.01 s)
	D. FLOW (Fine flow) COMP. STOP TIMER	74	26	0.00 to 99.99 s (Unit: 0.01 s)
	WAITING TIME FOR JUDGMENT	74	27	0.00 to 99.99 s (Unit: 0.01 s)
	DISCH. MONI. TIMER	74	28	0 to 90 for 999 s: OFF (Unit: s)
	DISCHARGE GATE CLOSE DELAY	74	29	0.00 to 99.99 s (Unit: 0.01 s)
	Weighing completion output time	74	30	0.00 to 99.99 s (Unit: 0.01 s)
	DISCHARGE FINISH OUTPUT ON	74	31	0.00 to 99.99 s (Unit: 0.01 s)
	MIXING FINISH OUTPUT ON	74	33	0.00 to 99.99 s (Unit: 0.01 s)
	MIXING TIME OUTPUT ON	74	34	0 to 9 999 s (Unit: s)
Weighing CALIBRATION	ZERO ADJUSTMENT (calibration)	75	01	Cannot be input
	SPAN ADJUSTMENT (calibration)	75	02	1 to 999 999
	WEIGHING CAPACITY (maximum load)	75	03	1 to 999 999
	MIN. SCALE DIVISION	75	05	1: [1]; 2: [2]; 3: [5]; 4: [10]; 5: [20]; 6: [50]
	ZERO POINT mV/V (fourth decimal place)	75	06	–2.500 0 to 2.500 0 mV/V (Unit: 0.0001 mV/V)

Item name	Command name	Command	Number	Return command setting value
	SPAN POINT mV/V registration (fourth decimal place)	75	07	–0.000 1 to 3.100 0 mV/V (Unit: 0.0001 mV/V)
	DECIMAL POINT	75	11	1: [0]; 2:[0.0]; 3: [0.00]; 4: [0.000]; 5: [0.0000]
	UNIT	75	12	1: [None]; 2: [g]; 3: [kg]; 4: [t]; 5: [lb]; 6: [N]; 7:[kN]
	BRIDGE POWER SUPPLY	75	13	1: [12 V]; 2: [6 V]; 3: [3V]
	OL DISPLAY CONDITION	75	14	1: [+9 D]; 2: [≥110%]; 3: [–20 D ~ 9 D]
	ADJ. (calibrate) BRAV. ACCELERATION	75	21	1: DISTRICT No.; 2: GRAVITY ACCELERATION
	CALIB. PLACE No.	75	22	01 to 16
	OPERATION PLACE No.	75	23	01 to 16
	CALIB. PLACE G.A.	75	24	9.000 to 9.999 (Unit: 0.001)
	OPERATION PLACE G.A.	75	25	9.000 to 9.999 (Unit: 0.001)
	ZERO POINT mV/V (fifth decimal place)	75	26	–2.50000 to 2.50000 mV/V (Unit: 0.00001 mV/V)
	Span point mV/V registration (fifth decimal place)	75	27	–0.00001 to 3.10000 mV/V (Unit: 0.00001 mV/V)
Servo calibration	Rated motor rotation speed	A0	01	500 to 10 000 r/min (Unit: r/min)
	Maximum input pulse frequency	A0	02	20 to 8 000 000 pps (Unit: pps)
	Input pulse per motor rotation	A0	03	20 to (8 000 000/(rated motor rotation/60)) pulses (Unit: pulse)
	Input pulse per rotation	A0	04	20 to 1 073 741 824 pulses (Unit: pulse)
	Command pulse method	A0	05	1: [1PULSE METHOD]; 2: [2PULSE METHOD]; 3: [2PHASE PULSE METHOD]
	Command pulse polarity	A0	06	1: [CW]; 2: [CCW]
	Command pulse logic	A0	07	1: [POSITIVE LOGIC]; 2: [NEGATIVE LOGIC]
	Open side software limit	A5	01	1: [EFFECTIVE]; 0: [INVALID]
	OPEN side software limit setting	A5	03	1.000 to 100.000 % (Unit: 0.001 %)
	CLOSE side software limit	A5	04	1: [EFFECTIVE]; 0: [INVALID]
	CLOSE side software limit setting	A5	06	–1.000 to –100.000 % (Unit: 0.001 %)
	Deviation software limit	A5	07	1: [EFFECTIVE]; 0: [INVALID]

Item name	Command name	Com-mand	Number	Return command setting value
	Deviation software limit setting	A5	09	1.000 to 100.000 % (Unit: 0.001 %)
	Alarm signal	A6	01	2: [BRIDGE]; 3:[OPEN]
	OPEN side limit signal	A6	02	1: [OFF]; 2: [BRIDGE]; 3: [OPEN]
	CLOSE side limit signal	A6	03	1: [OFF]; 2: [BRIDGE]; 3: [OPEN]
	Original point sensor sig-nal	A6	04	1: [OFF]; 2: [BRIDGE]; 3: [OPEN]
	Ready signal	A6	05	2: [BRIDGE]; 3: [OPEN]
PREVENT SCATTER	PREVENT SCATTER	AP	01	1: [OFF]; 2: [ARBITRARY]; 3: [QUADRATIC EQUATION]
	QUADRATIC EQUATION setting	AB	01	100 ~ 10,000 ms (Unit: ms)
	ARBITRARY			
	Number of points	AA	98	1 to 3
	Point1 time	AA	01	50 to 10 000 ms (Unit: ms)
	Point1 open rate	AA	04	0.000 to 100.000 % (Unit: 0.001 %)
	Point2 time	AA	11	50 to 10 000 ms (Unit: ms)
	Point2 open rate	AA	14	0.000 to 100.000 % (Unit: 0.001 %)
	Point3 time	AA	21	50 to 10 000 ms (Unit: ms)
	Point3 open rate	AA	24	0.000 to 100.000 % (Unit: 0.001 %)
Coarse flow	Coarse flow	AP	02	1:[FIXED OPEN (TIME)]; 2:[FIXED OPEN (WEIGHT)]
	FIXED OPEN (TIME)			
	Time	AC	01	50 to 10 000 ms (Unit: ms)
	Open rate	AC	04	0.000 to 100.000 % (Unit: 0.001 %)
	FIXED OPEN (WEIGHT)			
	Weight	AD	02	999 999
	Open rate	AD	04	0.000 to 100.000 % (Unit: 0.001 %)
Middle flow	Middle flow	AP	03	1: [FIXED OPEN (TIME)]; 2: [FIXED OPEN (WEIGHT)]; 3: [ARBITRARY]; 4: [QUADRATIC EQUATION]
	ARBITRARY			
	Number of points	AE	98	1 to 50
	Point1 time	AE	01	50 to 10 000 ms (Unit: ms)
	Point1 open rate	AE	04	0.000 to 100.000 % (Unit: 0.001 %)
	Point2 time	AE	11	50 to 10 000 ms (Unit: ms)

Item name	Command name	Com-mand	Number	Return command setting value
	Point2 open rate	AE	14	0.000 to 100.000 % (Unit: 0.001 %)
	Point3 time	AE	21	50 to 10 000 ms (Unit: ms)
	Point3 open rate	AE	24	0.000 to 100.000 % (Unit: 0.001 %)
	Point4 time	AE	31	50 to 10 000 ms (Unit: ms)
	Point4 time	AE	34	0.000 to 100.000 % (Unit: 0.001 %)
	Point5 open rate	AE	41	50 to 10 000 ms (Unit: ms)
	Point5 time	AE	44	0.000 to 100.000 % (Unit: 0.001 %)
	Point6 open rate	AE	51	50 to 10 000 ms (Unit: ms)
	Point6 time	AE	54	0.000 to 100.000 % (Unit: 0.001 %)
	Point7 open rate	AE	61	50 to 10 000 ms (Unit: ms)
	Point7 time	AE	64	0.000 to 100.000 % (Unit: 0.001 %)
	Point8 open rate	AE	71	50 to 10,000 ms (Unit: ms)
	Point8 time	AE	74	0.000 to 100.000% (Unit: 0.001%)
	Point9 open rate	AE	81	50 to 10 000 ms (Unit: ms)
	Point9 time	AE	84	0.000 to 100.000 % (Unit: 0.001 %)
	Point10 open rate	AE	91	50 to 10 000 ms (Unit: ms)
	Point10 time	AE	94	0.000 to 100.000 % (Unit: 0.001 %)
	Point11 open rate	AF	01	50 to 10 000 ms (Unit: ms)
	Point11 time	AF	04	0.000 to 100.000 % (Unit: 0.001 %)
	Point12 time	AF	11	50 to 10 000 ms (Unit: ms)
	Point12 open rate	AF	14	0.000 to 100.000 % (Unit: 0.001 %)
	Point13 time	AF	21	50 to 10 000 ms (Unit: ms)
	Point13 open rate	AF	24	0.000 to 100.000 % (Unit: 0.001 %)
	Point14 time	AF	31	50 to 10 000 ms (Unit: ms)
	Point14 open rate	AF	34	0.000 to 100.000 % (Unit: 0.001 %)
	Point15 time	AF	41	50 to 10 000 ms (Unit: ms)
	Point15 open rate	AF	44	0.000 to 100.000 % (Unit: 0.001 %)
	Point16 time	AF	51	50 to 10 000 ms (Unit: ms)
	Point16 open rate	AF	54	0.000 to 100.000 % (Unit: 0.001 %)
	Point17 time	AF	61	50 to 10 000 ms (Unit: ms)
	Point17 open rate	AF	64	0.000 to 100.000 % (Unit: 0.001 %)
	Point18 time	AF	71	50 to 10 000 ms (Unit: ms)
	Point18 open rate	AF	74	0.000 to 100.000 % (Unit: 0.001 %)
	Point19 time	AF	81	50 to 10 000 ms (Unit: ms)

Item name	Command name	Com-mand	Number	Return command setting value
	Point19 open rate	AF	84	0.000 to 100.000 % (Unit: 0.001 %)
	Point20 time	AF	91	50 to 10 000 ms (Unit: ms)
	Point20 open rate	AF	94	0.000 to 100.000 % (Unit: 0.001 %)
	Point21 time	AG	81	50 to 10 000 ms (Unit: ms)
	Point21 open rate	AG	84	50 to 10 000 ms (Unit: ms)
	Point22 time	AG	91	0.000 to 100.000 % (Unit: 0.001 %)
	Point22 open rate	AG	94	50 to 10 000 ms (Unit: ms)
	Point23 time	AG	01	0.000 to 100.000 % (Unit: 0.001 %)
	Point23 open rate	AG	04	50 to 10 000 ms (Unit: ms)
	Point24 time	AG	11	50 to 10 000 ms (Unit: ms)
	Point24 open rate	AG	14	0.000 to 100.000 % (Unit: 0.001 %)
	Point25 time	AG	41	50 to 10 000 ms (Unit: ms)
	Point25 open rate	AG	44	0.000 to 100.000 % (Unit: 0.001 %)
	Point26 time	AG	51	50 to 10 000 ms (Unit: ms)
	Point26 open rate	AG	54	0.000 to 100.000 % (Unit: 0.001 %)
	Point27 time	AG	61	50 to 10 000 ms (Unit: ms)
	Point27 open rate	AG	64	0.000 to 100.000 % (Unit: 0.001 %)
	Point28 time	AG	71	50 to 10 000 ms (Unit: ms)
	Point28 open rate	AG	74	0.000 to 100.000 % (Unit: 0.001 %)
	Point29 time	AG	81	50 to 10 000 ms (Unit: ms)
	Point29 open rate	AG	84	0.000 to 100.000 % (Unit: 0.001 %)
	Point30 time	AG	91	50 to 10 000 ms (Unit: ms)
	Point30 open rate	AG	94	0.000 to 100.000 % (Unit: 0.001 %)
	Point31 time	AH	01	50 to 10 000 ms (Unit: ms)
	Point31 open rate	AH	04	0.000 to 100.000 % (Unit: 0.001 %)
	Point32 time	AH	11	50 to 10 000 ms (Unit: ms)
	Point32 open rate	AH	14	0.000 to 100.000 % (Unit: 0.001 %)
	Point33 time	AH	21	50 to 10 000 ms (Unit: ms)
	Point33 open rate	AH	24	0.000 to 100.000 % (Unit: 0.001 %)
	Point34 time	AH	31	50 to 10 000 ms (Unit: ms)
	Point34 open rate	AH	34	0.000 to 100.000 % (Unit: 0.001 %)
	Point35 time	AH	41	50 to 10 000 ms (Unit: ms)
	Point35 open rate	AH	44	0.000 to 100.000 % (Unit: 0.001 %)
	Point36 time	AH	51	50 to 10,000 ms (Unit: ms)

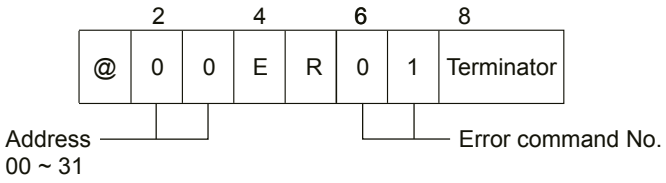
Item name	Command name	Com-mand	Number	Return command setting value
	Point36 open rate	AH	54	0.000 to 100.000 % (Unit: 0.001 %)
	Point37 time	AH	61	50 to 10 000 ms (Unit: ms)
	Point37 open rate	AH	64	0.000 to 100.000 % (Unit: 0.001 %)
	Point38 time	AH	71	50 to 10 000 ms (Unit: ms)
	Point38 open rate	AH	74	0.000 to 100.000 % (Unit: 0.001 %)
	Point39 time	AH	81	50 to 10 000 ms (Unit: ms)
	Point39 open rate	AH	84	0.000 to 100.000 % (Unit: 0.001 %)
	Point40 time	AH	91	50 to 10 000 ms (Unit: ms)
	Point40 open rate	AH	94	0.000 to 100.000 % (Unit: 0.001 %)
	Point41 time	AI	81	50 to 10,000 ms (Unit: ms)
	Point41 open rate	AI	84	0.000 to 100.000 % (Unit: 0.001 %)
	Point42 time	AI	91	50 to 10 000 ms (Unit: ms)
	Point42 open rate	AI	94	0.000 to 100.000 % (Unit: 0.001 %)
	Point43 time	AI	01	50 to 10 000 ms (Unit: ms)
	Point43 open rate	AI	04	0.000 to 100.000 % (Unit: 0.001%)
	Point44 time	AI	11	50 to 10 000 ms (Unit: ms)
	Point44 open rate	AI	14	0.000 to 100.000 % (Unit: 0.001 %)
	Point45 time	AI	41	50 to 10 000 ms (Unit: ms)
	Point45 open rate	AI	44	0.000 to 100.000 % (Unit: 0.001 %)
	Point46 time	AI	51	50 to 10 000 ms (Unit: ms)
	Point46 open rate	AI	54	0.000 to 100.000 % (Unit: 0.001 %)
	Point47 time	AI	61	50 to 10 000 ms (Unit: ms)
	Point47 open rate	AI	64	0.000 to 100.000 % (Unit: 0.001 %)
	Point48 time	AI	71	50 to 10 000 ms (Unit: ms)
	Point48 open rate	AI	74	0.000 to 100.000 % (Unit: 0.001 %)
	Point49 time	AI	81	50 to 10 000 ms (Unit: ms)
	Point49 open rate	AI	84	0.000 to 100.000 % (Unit: 0.001 %)
	Point50 time	AI	91	50 to 10 000 ms (Unit: ms)
	Point50 open rate	AI	94	0.000 to 100.000 % (Unit: 0.001 %)
	QUADRATIC EQUATION			
	Time	AJ	01	50 to 10 000 ms (Unit: ms)
	Inflection point	AK	05	0.000 to 100.000 % (Unit: 0.001 %)
	FIXED OPEN (TIME)			
	Time	AL	01	50 to 10 000 ms (Unit: ms)

Item name	Command name	Com-mand	Number	Return command setting value
	Open rate	AL	04	0.000 to 100.000 % (Unit: 0.001 %)
	FIXED OPEN (WEIGHT)			
	Weight	AM	02	999 999
	Open rate	AM	04	0.000 to 100.000 % (Unit: 0.001 %)
Fine flow	FIXED OPEN (WEIGHT)			
	Weight	AN	02	999 999
	Open rate	AN	04	0.000 to 100.000 % (Unit: 0.001 %)

Note:

- The command number during writing changes from [72], as described in the table, to [82].
- The command number during writing changes from [73], as described in the table, to [83].
- The command number during writing changes from [74], as described in the table, to [84].
- The command number during writing changes from [75], as described in the table, to [85].
- Set the SPAN calibration such that [WEIGHING CAPACITY (maximum load) ≥ SPAN ADJUSTMENT (calibration)]
- The same command can be used if this unit is installed in a system that has already used four digits after the decimal point to register ZERO point (No.06) and SPAN point (No.07) as mV/V.
- Note the mistake in the set digit number if the command is changed to five digits after the decimal point to register ZERO point (No.26) and SPAN point (No.27) as mV/V.
- The command number during writing changes from [A0],[A5]and[A6,]as described in the above table, to [B0],[B5]and[B6].
- The command number during writing changes from [AP], [AA], [AC], [AD], [AE]and [AF,]as described in the above table, to [BP], [BA], [BC],[BD], [BE]and [BF].
- The command number during writing changes from [AF], [AG]and[AH,]as described in the above table, to [BF], [BG]and [BH].
- The command number during writing changes from [AH], [AI], [AJ], [AK], [AM]and [AN,]as described in the above table, to [BH], [BI], [BJ], [BK], [BM]and [BN].

17.5.1.12 Error commands



Command No.	Name	Content
01	Command cannot be executed error status	Unconditionally replies when a command is received other than during weighing (Corresponding command is not judged.)
02	Other errors, depending on the command	At zero set error
10	Parity error	Parity error
11	Framing error	Stop bit detection error
12	Overrun error	Reading error
13	Data code error, data length error	The section below the command number is different from the condition.
14	No appropriate command	Process with no appropriate command number

Note:

- The error command is not returned if the address and completion code (terminator) cannot be detected.
- Dealing with this on the host side if the communication error command is returned from the device.
- Values are entered from the right.
- Set the number of characters for command setting section to 15 characters during reading/writing [BRAND]
- Sending error condition is as follows:
  - There is a disagreement in scale interval.
  - Characters other than numerical values are input for the set value.
  - Characters other than [+] or [–] are set under sign.

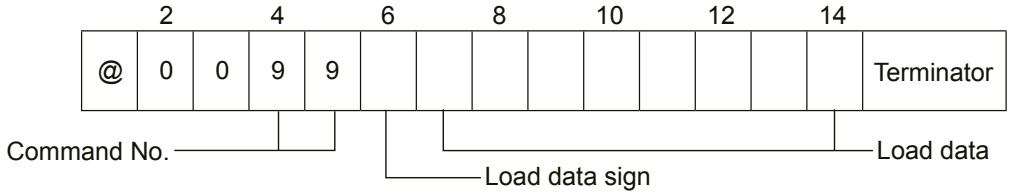
17.5.2 Data formats for (STREAM MODE), (SYNC. WITH PRINT), (SYNC. WITH ACCUM.), (SYNC. WITH FINISH)

Note:

- Load data is entered from the right.
- [–] is entered for negative values and [+] for positive values.
- Zero suppression is performed on the load data.
- A decimal point is added at the specified position if addition of decimal point is set to [YES] and the decimal point is specified on the calibration screen.
- [OL] is displayed on the load data part when there is an overload.
- The blank parts are all spaces.

17.5.2.1 When (TARGET OF STREAM/PRINT) is selected by (LOAD DISPLAY), (GROSS), or (NET)

Return (device → Host)



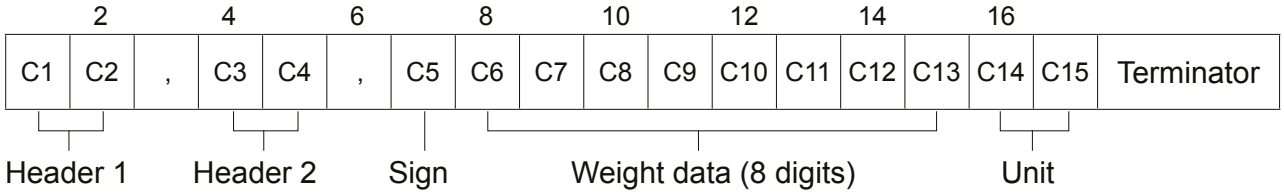
2	4	6	8	10	12	14	
@ 0	0	9	9	–		1 2	3 Terminator

2	4	6	8	10	12	14	
@ 0	0	9	9	+		0 . 1	2 3 Terminator

2	4	6	8	10	12	14	
@ 0	0	9	9	+		O	L Terminator

2	4	6	8	10	12	14	
@ 0	0	9	9	–		O	L Terminator

17.5.2.2 When (TARGET OF STREAM/PRINT) is selected by (LOAD DISP. WITH STATE)



Header 1			Header 2			Sign		Load data (8 digits)								Unit		
C1	C2	Description	C3	C4	Description	C5	Description	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	Description
O	L	Overload	N	T	Net weight	+	Plus						1	2	3		g	Gram
S	T	Stable	G	S	Gross weight	-	Minus				0	.	1	2	3	k	g	Kilogram
U	S	Unstable											O	L			t	Ton
																l	b	Pound
																	N	Newton
																k	N	Kilonewton

18 Maintenance

This chapter describes maintenance of the CSD-918.

18.1 Lifetime of used parts

The parts used in the instrument will have lifetime. It may differ depending on the application method and environmental conditions, the lifetime of each shall be as follows:

Name of Part	Application	Rough standard of lifetime
EEPROM	Record of set data	Write to EEPROM, one million times
Electrolytic capacitor	For smoothing switching power supply	Approx. 10 years
Liquid crystal display	Back light	Approx. 40 000 hours (typically) at 25 °C and surface luminance is about 50 % of initial one.
Battery	Back up of RAM	Approx. 10 years

EEPROM

When writing is made to EEPROM more than the time of lifetime, you can't write to the data anymore, so exchange shall be required.

Electrolytic capacitor

It may be influenced largely by some applied conditions such as environmental temperature and so on.

The lifetime is for about ten years when continuously driving in the air-conditioning normal use environment.

Liquid crystal display

The surface luminance becomes 50 % of the initial one after approx. 40 000 hours (typically) at 25 °C.

Battery

It may be influenced largely by some applied condition such as environmental temperature and so on.

The lifetime shall be for approx. 10 years in room temperature at 20 °C.

18.2 Replacing the fuse

If the fuse of CSD-918 blows, remove the top cover to replace it.

⚠ WARNING

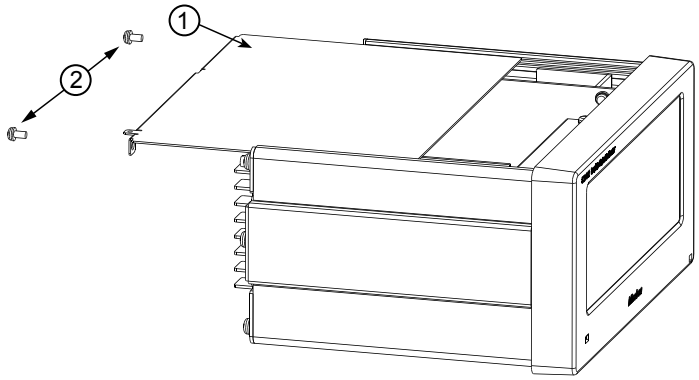
Damage from overheating.

The use of repaired fuses and bypassing the fuse holder is prohibited.

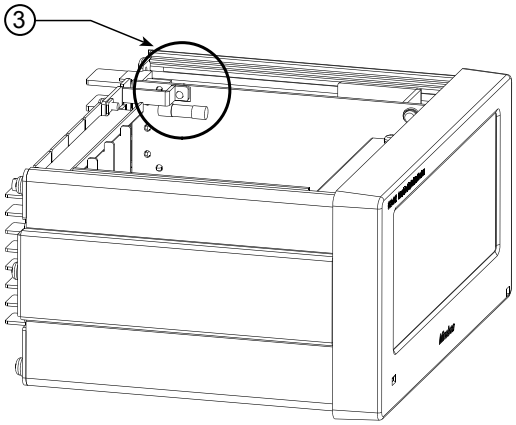
Incorrect fuse installation or inappropriate fuse capacity will result in malfunction.

- ▶ Before replacing the fuse, be sure to turn OFF the power to CSD-918.
- ▶ Only the time lag Fuse (2.5A) is permissible.

1. Turn off the power supply to the unit



2. Remove the top cover fixing screws ②.
3. Slide the top cover ① toward the back of the unit to remove the top cover.



4. Replace the fuse ③ (Time-lag fuse 2.5 A) that is attached to the board.
5. Attach the top cover.
6. Attach the top cover fixing screws ②.

19 Troubleshooting

This chapter describes corrective measures to be taken in the event of abnormal operation or if an error message is displayed.

When abnormal point(s) is/are found during the operation of the instrument, check by the following procedures.

Moreover, when you cannot find applicable item or solve the symptom of trouble even after you have taken some measures, contact with Minebea Intec.

19.1 Problems and corrective measures

Refer to this section to take corrective measures if the following operational abnormalities occur while using the CSD-918.

Contact the Minebea Intec if the problem is not covered or persists even after taking corrective measures.

19.1.1 Execute trouble shooting

Execute troubleshooting		
↓		
Does the supply power voltage satisfy specifications?	→ No→	Use a suitable supply power source.
↓		
Yes		
↓		
Does the liquid-crystal display function incorrectly?	→ Yes →	Check the liquid crystal display.
↓		
No		
↓		
Is the gate operation incorrect?	→ Yes →	Check the gate operation.
↓		
No		
↓		
Is weighing operation incorrect?	→ Yes →	Check the weighing operation.
↓		
No		
↓		
Is operation of standard communication incorrect?	→ Yes →	Check the standard communication.
↓		
No		
↓		
Does external control I/O malfunction?	→ Yes →	Check the external control I/O.
↓		
No		
↓		
Is/are operations of option(s) incorrect?	→ Yes →	Check the options.
↓		
No		
↓		
Provide Minebea Intec with details of malfunction.		

Check the liquid crystal display (LCD).

↓

POWER LED lights? → No → Fuse is broken. → Yes → Exchange fuses.

↓ ↓

Yes No ✶

↓

LCD displays? → No → Fuse is broken. → Yes → Exchange fuses.

↓ ↓

Yes No ✶

↓

Touch panel responds? → No → ✶

↓

Yes

↓

[OL] display? → Yes → ①

↓

No

↓

[-OL] display? → Yes → ①

↓

No

↓

Load display fluctuates abnormally? → Yes → ②

↓

No

↓

✶ Provide Minebea Intec with details of malfunction.

①

↓

- Remove the connecting cable from the load cell terminal block.
- Set the measurement range for the such measuring instruments as testers to V DC.
- Measure the voltage across A-C after shorting A-F and C-G on the terminal block.

↓

↓

Is the voltage across A and C stable at the set excitation voltage? → No → Contact Minebea Intec.

↓

Yes

↓

- Reconnect the connecting cable to the load cell terminal block.
- Check the load cell output voltage (refer to Chapter 13.5).

↓

Is monitor display out of ±3.1 mV/V range? → Yes → Shorten the terminal across B-D in the connector.

↓

No

↓

Recalibrate (see Chapter 6)

↓

Is the status unchanged? → Yes → Provide Minebea Intec with details of malfunction.

↓

No

↓

Start weighing

↓

Is monitor display out of ±3.1 mV/V range? → No → Consider the following causes.

- Input of load cell is out of the range of ±3.1 mV/V.
- Load cell is broken due to overload, etc.
- The signal cable for the load cell is disconnected.

↓

Yes

↓

②

↓

- Remove the connecting cable from the load cell terminal block.
- Set the measurement range for the such measuring instruments as testers to V DC.
- Measure the voltage across A-C after shorting A-F and C-G on the terminal block.

↓

↓

Is the voltage across A and C stable at the set excitation voltage? → No → Provide Minebea Intec with details of malfunction.

↓

Yes

↓

- Short B, D and C on the load cell terminal block.
- Check the load cell output voltage (refer to Chapter 13.5).

↓

Is the display steady at the optional value? → No → Provide Minebea Intec with details of malfunction.

↓

Yes

↓

Confirm the connecting status of all wires according to Chapter 4.
Confirm whether there is any influence from such noise sources as inverters.

↓

Status is unchanged? → No → Start weighing

↓

Yes

↓

Provide Minebea Intec with details of malfunction.

Check the gate operation.		
↓		
Is the wiring correct?	→ No →	Refer to Chapter 4.4 and confirm the specifications of the servo motor and the servo amplifier.
↓		
Yes		
↓		
Are the set values of the servo amplifier and servo motor correct?	→ No →	Refer to Chapter 7 and 11 and confirm the specifications of the servo motor and the servo amplifier.
↓		
Yes		
↓		
Is a positional calibration executed correctly?	→ No →	Refer to Chapter 7.6 and confirm the specifications of the servo motor and the servo amplifier.
↓		
Yes		
↓		
Is the intended operation executed?	→ No →	Refer to Chapter 7 and 11 and confirm the specifications of the servo motor and the servo amplifier.
↓		
Yes		
↓		
Provide Minebea Intec with details of malfunction.		

Check the measuring operation.		
↓		
Is the setting of I/O correct?	→ No →	Change the setting (refer to Chapter 10).
↓		
Yes		
↓		
Are BRAND set values suitable?	→ No →	Confirm and change set values (refer to Chapter 11.1).
↓		
Yes		
↓		
Is the intended operation executed?	→ No →	Set weighing and sequence control operations (refer to Chapter 11.7and 11.8).
↓		
Yes		
↓		
Provide Minebea Intec with details of malfunction.		

Check the external control I/O.		
↓		
Is the wiring correct?	→ No →	Reconnect (refer to Chapter 4.5).
↓		
Yes		
↓		
Is the external control I/O set?	→ No →	Set the external control I/O.
↓		
Yes		
↓		
Is the external control input incorrect?	→ No →	Provide Minebea Intec with details of malfunction.
↓		
Yes		
↓		
Is the pulse input item input signal 50 ms or more?	→ No →	Set the pulse input width to 50 ms or more.
↓		
Yes		
↓		
Is the level input item input signal 50 ms or more?	→ No →	Set the pulse input width to 50 ms or more.
↓		
Yes		
↓		
Provide Minebea Intec with details of malfunction.		

Check the standard communication		
↓		
Communication of serial interface is wrong.	→ Yes →	Move to check of serial interface communication.
↓		
No		
↓		
Standard RS-485 interface is wrong.	→ No →	Inform Minebea Intec about the contents of failure and situation in details at site.
↓		
Yes		
↓		
Is wiring correct?	→ No →	Connect surely with the external equipment (refer to Chapter 16.5).
↓		
Yes		
↓		
Address No. is correctly set.	→ No →	Set the address No. correctly (refer to Chapter 16.4).
↓		
Yes		
↓		
The communication protocol is correctly set.	→ No →	Set it correctly according to the specifications for host.
↓		
Yes		
↓		
Setting of command/data is correct.	→ No →	Use correct command/data (refer to Chapter 17.5).
↓		
Yes		
↓		
Host specifies the flow control.	→ Yes →	Switch the flow control at host side from [YES] to [NONE].
↓		
No		
↓		
Interval from the command receipt to the transmission is 1 ms or more.	→ Yes →	Set the interval from the command receipt to the transmission to 1 ms or more.
↓		
No		
↓		
Is the setting at the reply delay time appropriate to the response from host?	→ No →	The response from the host might be slow. Enlarge the response delay time of this unit.
↓		
Yes		
↓		
Inform Minebea Intec about the contents of failure and situation in details.		

Check the serial interface Communication		
↓		
Is wiring correct?	→ No →	Connect wires surely with external equipment (refer to Chapter 4.7).
↓		
Yes		
↓		
Communication protocol is correctly set.	→ No →	Set correctly (refer to Chapter 15.2).
↓		
Yes		
↓		
Target of print signal operation is correctly set.	→ No →	Use correct command/data (refer to Chapter 17.5).
↓		
Yes		
↓		
Inform Minebea Intec about the contents of failure and situation in details.		

Check on options		
↓		
Analog output operation is wrong.	→ Yes →	Check the analog output.
↓		
No		
↓		
The BCD output is wrong.	→ Yes →	Check the BCD output.
↓		
No		
↓		
RS-232C is wrong.	→ Yes →	Check the RS-232C interface.
↓		
No		
↓		
RS-422 is wrong.	→ Yes →	Check the RS-422.
↓		
No		
↓		
RS-485 is wrong.	→ Yes →	Check the RS-485.
↓		
No		
↓		
Inform Minebea Intec about the contents of failure and situation in details.		

Check the analog output		
↓		
Is wiring correct?	→ No →	Connect wires surely (refer to Chapter 17.1.3).
↓		
Yes		
↓		
Voltage output load resistance is 5 kΩ or more. Current output load resistance is 510 Ω or less.	→ No →	Apply the load resistance suitable for the specifications.
↓		
Yes		
↓		
Confirm the setting concerning the analog output.		
↓		
Set correctly.	→ No →	Set correctly (refer to Chapter 17.1).
↓		
Yes		
↓		
Inform Minebea Intec about the contents of failure and situation in details.		

Check BCD output		
↓		
Is wiring correct?	→ No →	Connect wires surely with external equipment (refer to Chapter 17.2.3).
↓		
Yes		
↓		
Except for the BCD are outputted.	→ Yes →	Match the setting concerning the BCD output to the specification of external equipment connected (refer to Chapter 17.2.3).
↓		
No		
↓		
The intended value is not output.	→ Yes →	Select the target of BCD output (refer to Chapter 17.2.3).
↓		
No		
↓		
BCD output does not change.	→ Yes →	Set the HOLD input opened.
↓		
No		
↓		
Inform Minebea Intec about the contents of failure and situation in details.		

Check the RS-232C interface		
↓		
Is wiring correct?	→ No →	Connect wires surely with external equipment (refer to Chapter 17.3.5).
↓		
Yes		
↓		
Communication protocol is correctly. set.	→ Yes →	Set it according to the host's specifications (refer to Chapter 17.3).
↓		
No		
↓		
Command/data is set suitably.	→ Yes →	Use correct command/data (refer to Chapter 17.5).
↓		
No		
↓		
Host specifies the flow control.	→ Yes →	Switch the flow control at host side from [YES] to [NONE].
↓		
No		
↓		
In Stream mode, intended value is not sent.	→ Yes →	Select the output target in the Stream mode.
↓		
No		
↓		
Inform Minebea Intec about the contents of failure and situation in details.		

Check the RS-422C interface		
↓		
Is wiring correct?	→ No →	Connect wires surely with external equipment (refer to Chapter 17.4.5).
↓		
Yes		
↓		
Address number is correctly set.	→ No →	Set the address number correctly (refer to Chapter 17.4.4).
↓		
Yes		
↓		
Communication protocol is correctly set.	→ No →	Set according to the specifications of host (refer to Chapter 17.4).
↓		
Yes		
↓		
Command/data is correctly set.	→ No →	Use correct command/data (refer to Chapter 17.5).
↓		
Yes		
↓		
Host specifies the flow control.	→ Yes →	Switch the flow control at host side from [YES] to [NONE].
↓		
No		
↓		
Switch of RS-422/485 is properly set.	→ No →	Switch of RS-422/485 interface correctly.
↓		
Yes		
↓		
Inform Minebea Intec about the contents of failure and situation in details.		

Check RS-485 interface		
↓		
Is wiring correct?	→ No →	Connect wires surely with external equipment (refer to Chapter 17.4.5).
↓		
Yes		
↓		
Address number is correctly set.	→ No →	Set the address number correctly (refer to Chapter 17.4.4).
↓		
Yes		
↓		
Communication protocol is correctly set.	→ No →	Set according to the specifications of host (refer to Chapter 17.4).
↓		
Yes		
↓		
Command/data is set properly.	→ No →	Use correct command/data (refer to Chapter 17.5).
↓		
Yes		
↓		
Host specifies the flow control.	→ Yes →	Switch the flow control at host side from [YES] to [NONE].
↓		
No		
↓		
Change of RS-422/485 is correctly set.	→ No →	Switch RS-422/485 correctly.
↓		
Yes		
↓		
Interval from the command receipt of host to send is 1 ms or more.	→ Yes →	Set the interval from the command receipt to the transmission at the host side to 1 ms or more.
↓		
No		
↓		
Is it appropriate setting for the response delay time to the response of host?	→ No →	The response from the host might be slow. Enlarge the response delay time of this unit.
↓		
Yes		
↓		
Inform Minebea Intec about the contents of failure and situation in details.		

19.2 Error display and buzzer sound

19.2.1 Error display

	Battery LO error. Contact Minebea Intec.

Er-2	In the load calibration, it blinks for about 2 seconds when you set the amount out of the setting range.
Er-3	A/D conversion error. Contact Minebea Intec.
Er-4	Board connection error. Contact Minebea Intec.
Er-b	Backup data damaged. Contact Minebea Intec.
Er-E	Writing access error to EEPROM. Contact Minebea Intec.
Er-r	Reading access error from EEPROM. Contact Minebea Intec.
rE-L	In the load calibration, it blinks for about 2 seconds when the numeric input of load cell output is less than -2.5 mV/V and exceeding the minus side of zero calibration range.
rE-H	In the load calibration, it blinks for about 2 seconds when the numeric input of load cell output is more than 2.5 mV/V and exceeding the plus side of zero calibration range.
SP-L	In the load calibration, it blinks for about 2 seconds when the numeric input of load cell output is 0 mV/V or less and not reaching to the SPAN calibration range.
SP-H	In the calibration, it blinks for about 2 seconds when the numeric input of load cell output is 3.1 mV/V or more and exceeding the SPAN calibration range.
Ln-L	In the digital linearize compensation, it blinks for about 2 seconds when the load-cell output is low.
Ln-H	In the digital linearize compensation, it blinks for about 2 seconds when the load-cell output is high.
-------	In turning on the power, it displays when the load display value is higher than the regulated value and power on zero is effective.
8888888	In turning on the power, it displays when the load display value is not stable and power on zero is effective.
oL	It displays when the load display value is exceeding [+ (weighing capacity) + 9D], or exceeding the "+110 % of the max. load (Max)".
-oL	It displays when the load display value is exceeding [- (weighing capacity) - 9D], or exceeding the "-110 % of the max. load (Max)".
oUF	It displays when the input from the load cell is exceeding the upper input limit of A/D converter

-oUF	It displays when the input from the load cell is exceeding the lower input limit of A/D converter
oHG	It displays when the power on original point detection is effective, and while detecting the original point.
Red display of accumulated value and times	The color of the character turns red when the result of the accumulated value and times exceeds the display range.

19.2.2 Zero error display

Error code	Cause	Action
Z.ERR ZERO	In case of executing ZERO set out of range of zero set.	Check the range of zero set is appropriate.
Z.ERR A/Z	In case of executing TARE out of range of tare.	Execute the TARE within the operational range of tare.

Note:

Tap [ERR.RESET] on top left corner of the screen to cancel the zero error.

19.2.3 Sequence error display

Error code	Error No.	Contents	Measures
SQERR 0	1	Stop compulsorily by inputting the temporary stop while weighing.	Restart after checking the source of the temporary stop.
SQERR 1	2	When the condition of SAFETY CHECK is not satisfied.	Check the input of SAFETY CHECK.
SQERR 2	3	When the load value is under even if the supplementary flow is executed.	Restart after changing the supplementary flow time and count.
SQERR 3	4	When there is contradiction in the amount of the comparison value.	Solve the contradiction of amount after checking the setting value.
SQERR 4	5	When the batching time exceeds the limited time.	Check the blocking at the batching gate.
SQERR 5	6	When the discharging time exceed the limited time.	Check the blocking at the discharging gate.
SQERR 6	7	When the gross value is smaller than the final value in discharge control.	Add the material.
SQERR 7	8	When the net value > (final value – dribble flow)in the start	Remove the contents in the container.
SQERR 8	9	In controlling the nozzle, when the change of the load value exceeds the zero band.	Check the position of nozzle.

Error code	Error No.	Contents	Measures
SQERR 9	:	The measurement begins in the condition that [START ABOVE ZERO BAND] is [EFFECTIVE], however the container is not put on the weighing section.	Check whether the container is put.
SQ.ERR 10	;	When you input the weighing signal while the gate is operated with manual.	Confirm if this unit is in weighing mode.
SQ.ERR 11	<	When the weighing signal is input excluding the original point position of gate	Confirm the position of the gate.

Note:

Tap [ERR.RESET] on top left corner of the display to cancel the sequence error.

19.2.4 Error alarm buzzer

When key lock is active, tapping any key sounds a buzzer twice.

Note:

Refer to Chapter 10.5 for more information.

19.3 Display of servo error

Error code	Error No.	Cause	Action
SV.ERR EMG	1	The emergency stop is detected.	Turn on the power again after confirming the cause that the emergency stop detected.
SV.ERR ALM	2	The servo alarm signal is output from the servo amplifier.	Turn on the power again after confirming the servo amplifier and the servo motor.
SV.ERR RD	3	The ready signal is not output from the servo amplifier.	Confirm the servo amplifier and the servo motor.
SV.ERR +LMT	4	The gate is exceeding the OPEN side limit position.	Move it to the right position after confirming the position of the gate.
SV.ERR -LMT	5	The gate is exceeding the CLOSE side limit position.	Move it to the right position after confirming the position of the gate.
SV.ERR SLMT	6	The gate is exceeding the software limit position.	Move it to the right position after confirming the position of the gate.
SV.ERR ORG	7	The original point cannot be detected by the power on original point detection.	Detect the original point by a position calibration after confirming the position of the gate.

Note:

Tap [ERR.RESET] on top left corner of the display to cancel the servo error.

20 Appendix

This chapter provides supplementary information about CSD-918, such as menu lists, customer service, and data communication formats.

20.1 Screen transition flow chart

The transition flow from the weighing screen to each setting items as follows.

WEIGHING

MENU 1/2	Menu screen 1/2
GRAPHIC DISPLAY	see Chapter 5.2
BRAND CODE	see Chapter 5.2
BASIC FUNCTION	see Chapter 5.2
I/O	see Chapter 5.2
WEIGHING OPERATION	see Chapter 5.2
SEQUENCE CONTROL	see Chapter 5.2
CALIBRATION	see Chapter 5.2
SERVO CALIBRATION	see Chapter 5.2
BUILT-IN SERIAL I/F	see Chapter 5.2
MENU 2/2	Menu screen 2/2
SYSTEM	see Chapter 5.2
OPTION	see Chapter 5.2
CHECK	see Chapter 5.2

20.1.1 BRAND CODES

WEIGHING

MENU 1/2	Menu screen 1/2
BRAND CODE	Brand code screen

BRAND CODE

BRAND CODE 1/2	Brand code 1/2
FINAL	see Chapter 11.1.4
PREVENT SCATTER	see Chapter 11.1.4
FULL FLOW (Coarse flow)	see Chapter 11.1.4
MEDIUM FLOW (Middle flow)	see Chapter 11.1.4
DRIBBLE FLOW (Fine flow)	see Chapter 11.1.4
OVER	see Chapter 11.1.4
UNDER	see Chapter 11.1.4
ZERO BAND	see Chapter 11.1.4
FULL	see Chapter 11.1.4
BRAND CODE 2/2	Brand code 2/2
A.F.F COMPENSATION	see Chapter 11.1.4
SUPPLEMENTARY FLOW TIME	see Chapter 11.1.4
JUDGE.AFTER S-FLOW WAIT	see Chapter 11.1.4
ACCUM. VALUE	see Chapter 11.1.4
ACCUM. TIMES	see Chapter 11.1.4
PRESET TARE	see Chapter 11.1.4

20.1.2 BASIC FUNCTIONS

WEIGHING

MENU 1/2	Menu screen 1/2

├─ **BASIC FUNCTION**	Basic function screen

BASIC FUNCTION

├─ **BASIC FUNCTION 1/4**	Basic function 1/4
│ ├─ **DISP. REFRESH RATE**	see Chapter 9.2
│ ├─ **A/D SAMPLING RATE**	see Chapter 9.3
│ ├─ **ANALOG FILTER**	see Chapter 9.4
│ ├─ **DIGITAL FILTER**	see Chapter 9.5
│ ├─ **STABILIZATION FILTER**	see Chapter 9.6.1
│ ├─ **STAB. FILTER TIME**	see Chapter 9.6.3
│ ├─ **STAB. FILTER BAND**	see Chapter 9.6.2
│ ├─ **STAB. DETECTION TIME**	see Chapter 9.7.2
│ ├─ **STAB. DETECTION BAND**	see Chapter 9.7.1
├─ **BASIC FUNCTION 2/4**	Basic function 2/4
│ ├─ **OPERATION OF ZERO**	see Chapter 9.8.1
│ ├─ **RANGE OF ZERO**	see Chapter 9.8.2
│ ├─ **TARGET OF ZERO TRACKING**	see Chapter 9.9.1
│ ├─ **ZERO TRACKING TIME**	see Chapter 9.9.3
│ ├─ **ZERO TRACKING BAND**	see Chapter 9.9.2
│ ├─ **OPERATION OF TARE**	see Chapter 9.10.1
│ ├─ **RANGE OF TARE**	see Chapter 9.10.2
│ ├─ **OPERATION OF PRE. TARE**	see Chapter 9.11.1
│ ├─ **PRESET TARE = 0 CHOICE**	see Chapter 9.11.2
├─ **BASIC FUNCTION 3/4**	Basic function 3/4
│ ├─ **ZERO AT POWER ON**	see Chapter 9.12.1
│ ├─ **ZERO CLR. AT POWER ON**	see Chapter 9.12.2
│ ├─ **TARE AT POWER ON**	see Chapter 9.13.1
│ ├─ **TARE CLEAR AT POWER ON**	see Chapter 9.13.2
│ ├─ **OPERATION OF HOLD**	see Chapter 9.14
│ ├─ **PRINT COMMAND**	see Chapter 9.15
│ ├─ **ACCUM. COMMAND**	see Chapter 9.16.1
│ ├─ **GRAPH TRIGGER SETTING**	see Chapter 9.17
│ ├─ **GRAPH TRIGGER LEVEL**	see Chapter 9.18
├─ **BASIC FUNCTION 4/4**	Basic function 4/4
│ ├─ **SELECTION OF SCREEN**	see Chapter 10.6
│ ├─ **OPERATION OF STABILITY**	see Chapter 9.7.3
│ ├─ **COMPARATIVE RESULT HOLD**	see Chapter 9.19
│ ├─ **S-I/F HOLD**	see Chapter 9.20
│ ├─ **LOAD DISPLAY VALUE HOLD**	see Chapter 9.21

20.1.3 I/Os

WEIGHING

├─ **MENU 1/2**	Menu screen 1/2
│ ├─ **I/O**	I/O setting screen

I/O

├─ **I/O SETTING 1/6**	I/O setting screen 1/6
│ ├─ **FUNCTION OF F1 KEY**	see Chapter 10.2.1
│ ├─ **FUNCTION OF F2 KEY**	see Chapter 10.2.1
│ ├─ **FUNCTION OF F3 KEY**	see Chapter 10.2.1
│ ├─ **FUNCTION OF F4 KEY**	see Chapter 10.2.1

I/O SETTING 2/6	I/O setting screen 2/6
I/O INPUT FROM 1 TO 9	see Chapter 10.3.2
I/O SETTING 3/6	I/O setting screen 3/6
I/O INPUT FROM 10 TO 11	see Chapter 10.3.2
I/O SETTING 4/6	I/O setting screen 4/6
I/O OUTPUT FROM 1 TO 9	see Chapter 10.3.3
I/O SETTING 5/6	I/O setting screen 5/6
I/O OUTPUT FROM 10 TO 11	see Chapter 10.3.3
I/O OUTPUT LOGIC	see Chapter 10.3.4
I/O SETTING 6/6	I/O setting screen 6/6
ZERO KEY LOCK	see Chapter 10.5
GROSS/NET KEY LOCK	see Chapter 10.5.2
TARE KEY LOCK	see Chapter 10.5.2
BRAND CODE KEY LOCK	see Chapter 10.5.2
F KEY LOCK	see Chapter 10.5.2
MENU KEY LOCK	see Chapter 10.5.2
CALIBRATION KEY LOCK	see Chapter 10.5.2
SERVO CALIBRATION KEY LOCK	see Chapter 10.5.2

20.1.4 WEIGHING OPERATIONS

WEIGHING

MENU 1/2	Menu screen 1/2
WEIGHING OPERATION	Weighing operation screen

WEIGHING OPERATION

WEIGHING OPERATION SETTING 1/2	Weighing operation setting screen 1/2
CONTROL MODE	see Chapter 11.7.2
COMPARISON	see Chapter 11.7.2
COMP. OF ZERO BAND	see Chapter 11.7.2
COMPARATIVE OF FULL	see Chapter 11.7.2
SAVE THE A.F.F.	see Chapter 11.7.2
BATCHING SAFETY CHECK	see Chapter 11.7.2
DISCH. SAFETY CHECK	see Chapter 11.7.2
MIXING SAFETY CHECK	see Chapter 11.7.2
GENERAL SAFETY CHECK	see Chapter 11.7.2
WEIGHING OPERATION SETTING 2/2	Weighing operation setting screen 2/2
AUTOMATIC ACCUM.	see Chapter 11.7.2
CONDITION OF AUTO ACM.	see Chapter 11.7.2
AUTOMATIC PRINT	see Chapter 11.7.2

20.1.5 SEQUENCE CONTROL

WEIGHING

MENU 1/2	Menu screen 1/2
SEQUENCE CONTROL	Sequence control screen

SEQUENCE CONTROL

SEQUENCE CONTROL 1/3	Sequence control screen 1/3
BATCH START SEQUENCE	see Chapter 11.8.2
OPERATION OF NOZZLE	see Chapter 11.8.2
JUDGE CONDITION	see Chapter 11.8.2

├─ **BATCH FINISH ACTIONS**	see Chapter 11.8.2
├─ **DISCHARGE FINISH ACTIONS**	see Chapter 11.8.2
├─ **MAXTIME OF COMPENSATION**	see Chapter 11.8.2
├─ **COMPENSATION FLOW EVAL**	see Chapter 11.8.2
SEQUENCE CONTROL 2/3	Sequence control screen 2/3
├─ **A.F.F. COMPENSATION**	see Chapter 11.8.2
├─ **BATCH FINISH OUTPUT OFF**	see Chapter 11.8.2
├─ **TARE BATCH START DELAY**	see Chapter 11.8.2
├─ **BATCH MONITORING TIMER**	see Chapter 11.8.2
├─ **BATCH START DELAY TIMER**	see Chapter 11.8.2
├─ **F-FLOW COMP. STOP TIMER**	see Chapter 11.8.2
├─ **M-FLOW COMP. STOP TIMER**	see Chapter 11.8.2
├─ **D-FLOW COMP. STOP TIMER**	see Chapter 11.8.2
├─ **WAITING TIME FOR JUDG.**	see Chapter 11.8.2
SEQUENCE CONTROL 3/3	Sequence control screen 3/3
├─ **DISCH. MONI. TIMER**	see Chapter 11.8.2
├─ **DISCH.-GATE CLOSE DELAY**	see Chapter 11.8.2
├─ **BATCH FINISH OUTPUT ON**	see Chapter 11.8.2
├─ **DISCH. FINISH OUTPUT ON**	see Chapter 11.8.2
├─ **MIXING FINISH OUTPUT ON**	see Chapter 11.8.2
├─ **MIXING TIME OUTPUT ON**	see Chapter 11.8.2

20.1.6 CALIBRATION

WEIGHING	
MENU 1/2	Menu screen 1/2
├─ **CALIBRATION**	Calibration screen

CALIBRATION	
CALIBRATION 1/2	Calibration screen 1/2
├─ **DIVISION**	see Chapter 6.3.4
├─ **WEIGHING CAPACITY**	see Chapter 6.3.5
├─ **ZERO ADJUSTMENT**	see Chapter 6.3.6
├─ **ZERO POINT MV/V**	see Chapter 6.3.6.2
├─ **SPAN ADJUSTMENT**	see Chapter 6.3.7
├─ **SPAN POINT MV/V**	see Chapter 6.3.7.2
├─ **PITCH CONFIRMATION**	see Chapter 6.5.3
├─ **PITCH CONFIRMATION SET**	see Chapter 6.5.1
├─ **DECIMAL POINT**	see Chapter 6.8.1
CALIBRATION 2/2	Calibration screen 2/2
├─ **FINE ADJUSTMENT**	see Chapter 6.4
├─ **DIGITAL LINEARIZE**	see Chapter 6.6
├─ **BRIDGE POWER SUPPLY**	see Chapter 6.3.3
├─ **OL DISPLAY CONDITION**	see Chapter 6.8.2
├─ **UNIT**	see Chapter 6.8.3
├─ **ADJ. GRAV. ACCELERATION**	see Chapter 6.8.4
├─ **CALIB. PLACE NO.**	see Chapter 6.8.4
├─ **CALIB. PLACE G.A.**	see Chapter 6.8.4

20.1.7 SERVO CALIBRATION

WEIGHING	
MENU 1/2	Menu screen 1/2

SERVO CALIBRATION	Servo calibration screen

CALIBRATION

CALIBRATION 1/2	Calibration screen 1/2
CONFIGURATION	see Chapter 7.3
INPUT ENABLE STATE	see Chapter 7.4
MANUAL SPEED CALIB.	see Chapter 7.5
POSITION CALIB.	see Chapter 7.6
MANUAL CONTROL	see Chapter 7.7
SOFTWARE LIMIT	see Chapter 7.8

20.1.8 BUILT-IN SERIAL I/F

WEIGHING

MENU 1/2	Menu screen 1/2
BUILT-IN SERIAL I/F	Built-in serial I/F screen

BUILT-IN SERIAL I/F

BUILT-IN SERIAL I/F 1/1	Built-in serial I/F screen 1/1
RS-485	see Chapter 16.4
S.-I/F	see Chapter 15.1

20.1.9 SYSTEM

WEIGHING

MENU 2/2	Menu screen 2/2
SYSTEM	System screen

SYSTEM

SYSTEM 1/1	System screen 1/1
BACKLIGHT OFF TIME	see Chapter 12.2
COMPARATOR MEMORY CLR.	see Chapter 12.3.1
OPERATIONAL MEMORY CLR.	see Chapter 12.3.2

20.1.10 OPTIONS

WEIGHING

MENU 2/2	Menu screen 2/2
OPTIONAL	Optional screen

OPTIONAL

OPTIONAL 1/1	Optional screen 1/1
RS-232C	see Chapter 17.3
RS-422/485	see Chapter 17.4
ANALOG OUTPUT	see Chapter 17.1
BCD OUTPUT	see Chapter 17.2.1

20.1.11 CHECKS

WEIGHING

MENU 2/2	Menu screen 2/2
CHECK	Check screen

CHECK

CHECK 1/1	Check screen 1/1
ROM VERSION	see Chapter 13.2
CHECK OF DISPLAY	see Chapter 13.3
CHECK OF I/O	see Chapter 13.4
MONITOR	see Chapter 13.5
BCD OUTPUT	see Chapter 13.6
ANALOG OUTPUT	see Chapter 13.7
MAINTENANCE DATE	see Chapter 13.8
MAINTENANCE NO	see Chapter 13.9

20.2 Customer service

Warranty

The device warranty period is one year from the date of delivery.

Consult Minebea Intec sales office or point of purchase for repairs or customer service during the warranty period.

Repair

Before requesting a repair, check once again that all of the wiring/settings/adjustments are correct.

In particular, check the load cell for disconnected and/or broken wires. If the problem persists, contact Minebea Intec sales office or point of purchase to request repair service.

20.3 Specifications

20.3.1 Analog specifications

Bridge power supply		Within DC12 V±0.3 V, 140 mA (DC3 V and 6 V can be switched) with remote sensing applied.
Applicable load cell		Up to 4 load cells (for 350 Ω) can be connected in parallel.
Input sensitivity		0.3 µV/d or more (d = minimum scale interval)
Input range		-3.1 mV/V to 3.1 mV/V
Zero setting range		±2.5 mV/V
Non-linearity		0.01 % F.S.
Temperature influence	Zero	±0.1 µV/°C (calibrated at an input sensitivity of 0.3 µV/d or more)
	Sensitivity	±0.000 8 % F.S./°C (calibrated at an input sensitivity of 0.3 µV/d or more)
Input noise		±0.2 µVp-p or less (at the default setting for analog filter, digital filter, stabilization filter and A/D sampling rate)
Analog filter		Approx. 4 Hz (can be changed to 2 Hz, 6 Hz, 8 Hz, 10 Hz or 100 Hz)
A/D sampling rate		200 times/s (can be switched to 1 000 times/s, 100 times/s, 50 times/ s, 20 times/s or 10 times/s)
A/D internal resolution		24 bit

20.3.2 Display specifications

Display	Display	Wide viewing angle 6.2 inch TFT color LCD unit
	Number of dots	640 dots x 240 dots
	Dot pitch	0.077 mm x 0.231 mm
Backlight	Brightness	Approx. 130 cd/m^2 (typically)
	Life	Approx. 40 000 h at 25 °C (typically) before the surface brightness will reach 50 % of initial.
Load display	Display range	-999 999 to 999 999
	Display increment	1 (can be changed to 2, 5, 10, 20 or 50)
	Display style	7-segment method (character height: 22 mm)
	Overload displays	[-OL] for negative overload, [OL] for positive overload
	AD value overload display	[-OVF] for negative overload, [OVF] for positive overload
Condition display		GROSS / NET, TARE, PRE.TARE, STABLE, HOLD, Z-ERR, RUN, CZ, F.FLOW, M.FLOW, D.FLOW, OVER, OK, UNDER, FULL, Z-BAND, FINISH, BATCH / DISCH. SEQ. / MEAS. /OUT / MI
Display refresh rate		4 times/s (can be changed to 20 times/s)
Decimal point display		Can be switched between no display, 10^1, 10^2, 10^3 and 10^4
Unit display		Can be switched between none, g, kg, t, lb, N and kN.
Setting value display		Final, F.FLOW, M.FLOW, Over, Under, D.FLOW
Brand display		Code No.: 00 to 99, Brand name: Up to 15 characters
Accumulation display		Accumulation value : 0 to 99 999 999, Accumulation times : 0 to 999 999
Graphic display		The weighing status is displayed as a waveform.

20.3.3 Interfaces

External control input	11 functions can be selected from the following: OFF, Gross weight/Net weight, Zero, Zero clear, Tare weight, Tare weight clear, Inflow start, Discharge start, Mixing start, Manual overshoot correction, Accumulation command, Cancel accumulation, Temporary stop, Restart, Clear the accumulation data of read-out, Clear the accumulation data of all brand codes, Force-finish weighing operation, Force-finish discharge, Reset error, Print command Above are for pulse input, and effective only once at a pulse width of 50 ms or longer. Switch inflow and discharge, SAFETY CHECK input No. 1, SAFETY CHECK input No. 2, SAFETY CHECK input No. 3, SAFETY CHECK input No. 4, SAFETY CHECK input No. 5, SAFETY CHECK input No. 6, SAFETY CHECK input No. 7, SAFETY CHECK input No. 8, Manual coarse flow, Manual middle flow, Manual fine flow, Manual discharge, Hold, MANUAL CONTROL The above level input items are valid at a bridge input of 50 ms or more.

External control output	11 functions can be selected from the following: OFF, Stable, Zero band, Full, Coarse flow, Middle flow, Fine flow, Over, OK, Under, Mixture, Discharge (between the discharge gates), Finish weighing, Finish flow, Finish mixture, Nozzle descent, During weighing, Measurement sequence error, Abnormal weight, Error, During tare weight cancellation, Center zero, Display gross weight, Display net weight, During hold, Servo error
2-pin method serial interface	2-pin method serial interface Baud rate: 600 bps Data bit length: 8 bit Parity bit: Odd Stop bit: 1 bit Start bit: 1 bit Communication data: Binary code (BCD) The internal circuit is insulated by optocoupler. External control input and common are connected.
Standard RS-485 interface	Baud rate: Can be selected from 1 200, 2 400, 4 800, 9 600, 19 200 and 38 400 bps Data bit length: Can be selected from 7 bit and 8 bit Parity bit: Can be selected from none, even and odd Stop bit: Can be selected from 1 bit and 2 bit Terminator: Can be selected from CR+LF and CR Communication method: Half duplex Synchronization method: Start-stop synchronous method Address: Select from 0 to 31 Communication data: ASCII code Cable length: Approx. 1 km Connectable units: 32 units maximum Termination resistance: External Data transmission mode: Select from command mode and stream mode Internal circuit and common are connected.
Servo control interface	Output Command pulse Input Encoder pulse, Alarm signal, Emergency stop signal, OPEN side limit signal, CLOSE side limit signal, Ready signal, Original point sensor signal
BCD output (optional)	Output BCD 8-digit parallel output: With polarity (POL.) (output ON when negative, output OFF when positive); P.C.(Print command): Turn on after conversion of BCD output is completed during fixed time; Decimal point ERROR ON when various errors occur; OVER, STABLE, Gross weight: ON when BCD output is gross weight Open collector output VCE = DC35 V, IC = DC40 mA MAX The output is not updated, except in weighing mode. Input HOLD for BCD output. BCD-ENABLE compulsory OFF for output related to BCD (high impedance) The above level input items are valid at a bridge input of 100 ms or more.

RS-232C (optional)	Baud rate: Can be selected from 1 200, 2 400, 4 800, 9 600, 19 200 and 38 400 bps Data bit length: Can be selected from 7 bit and 8 bit Parity bit: Can be selected from none, even and odd Stop bit: Can be selected from 1 bit and 2 bit Terminator: Can be selected from CR+LF and CR Communication method: Half duplex Synchronization method: Start-stop synchronous method Communication data: ASCII code
RS-422/485 (optional)	Baud rate: Can be selected from 1 200, 2 400, 4 800, 9 600, 19 200 and 38 400 bps Data bit length: Can be selected from 7 bit and 8 bit Parity bit: Can be selected from none, even and odd Stop bit: Can be selected from 1 bit and 2 bit Terminator: Can be selected from CR+LF and CR Communication method: Half-duplex Synchronization method: Start-stop synchronous method Address: Select from 0 to 31 Transmission data: ASCII code Cable length: Approx. 1 km Connectable units: 32 units maximum (RS-422: 10 units) Termination resistance: Internal (Select by terminal block connection) I/O monitor with LED RS-422/485 changeover: Set by communication planning display
Current output (optional)	Output: 4 mA to 20 mA DC Load resistance: 510 Ω or less Resolution: 1/12 000 or more Non-linearity: Within 0.02 % F.S. Overload range: 2.4 mA DC for [OL] display 21.6 mA DC Output times: Synchronized with A/D sampling The internal circuit is insulated by optocoupler. Temperature effect at zero point: ≥ 0.005 % F.S./°C; Sensitivity: ≥ 0.005 % F.S./°C
Voltage output (optional)	Output: 0 V to 10 V DC Load resistance: 5 kΩ or more Resolution: 1/12 000 or more Non-linearity: 0.02% F.S. or more Overload range: Approx. –1 V at [–OL] display; At [OL] display: Approx. 11 V Output times: Synchronized with A/D sampling The internal circuit is insulated by photocoupler. Temperature effect at zero point: ≥ 0.015 % F.S./°C; Sensitivity: ≥ 0.015 % F.S./°C

20.3.4 General specifications

Operating temperature range	Temperature	0°C to 40°C

	Humidity	85 % RH or lower (non-condensing)
Storage temperature range		-20°C to 60°C
Power supply	Power supply voltage	100 V AC to 240 V AC (Permissible variation: 85 V AC to 264 V AC)
	Power supply frequency	50/60 Hz
	Power consumption	Approx. 23 VA (No options at 100 V AC.) Approx. 34 VA at maximum (With options attached at 100 V AC.)
External dimensions (W × H × D)		96 mm × 192 mm × 132 mm (Excludes protrusion parts.)
Weight		Approx. 1.6 kg (without options)

20.3.5 Standard shipping specifications

Bridge power supply	12 V DC
SPAN calibration	10 000 display at 0.3 mV/V input
Minimum scale interval	1

20.3.6 Accessories

Operating instructions	1 piece
Time-lag fuse (2.5 A)	1 piece
I/O connector for external control	1 piece (Connector: FCN-361J024-AU; Connector cover: FCN-360C024-B)
Servo control interface connector	1 piece (Connector: FCN-361J032-AU; Connector cover: FCN-360C032-B)
Standard interface connector	1 piece (Plug: XW4B-06B1-H1)
Bridge for A-F and C-G	2 pieces
Panel mounting gasket	1 piece
BCD output connector	1 piece (only included if the optional BCD output is installed)
Connector for current output	1 piece (only included if the optional current output is installed)
Connector for voltage output	1 piece (only included if the optional voltage output is installed)
RS-422/485 interface connector	1 piece (only included if the optional RS-422/485 interface is installed)

20.4 RS-232C/422/485 communication data formats

20.4.1 Command mode data formats

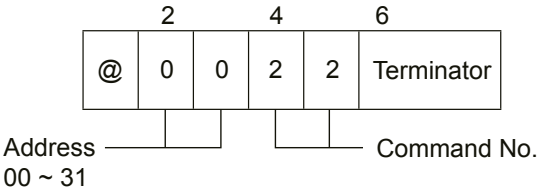
Note:

- The address is fixed to [00] for the application of RS-232C interface.
- Load data is entered from the right end.
- The minus sign ([-]) is entered for all negative values. The plus sign ([+]) is entered for all positive values.
- Zero suppression is applied to load data.
- In the case of overload, [OL] is displayed under load data.
- The blank parts are all spaces.
- When the addition of decimal point is set as [Yes] and the decimal point is specified on the Calibration screen, the decimal point is added to the specified position.

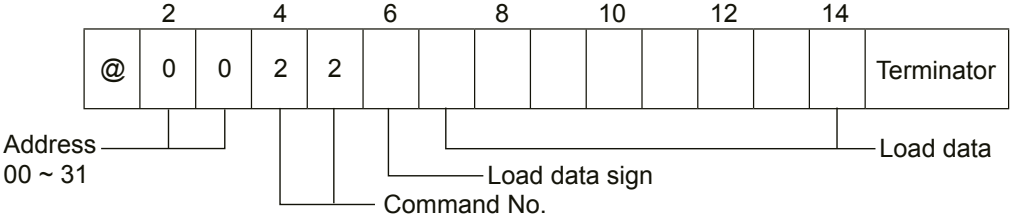
20.4.1.1 Reading out the load data (host → device)

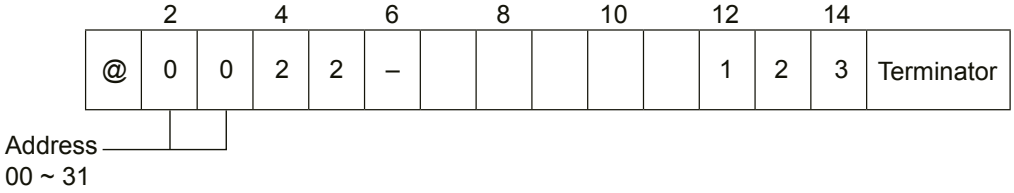
Command No.	Operation
20	Reading load data
21	Reading gross weight
22	Reading net weight
23	Reading tare weight
26	Reading load data with conditions

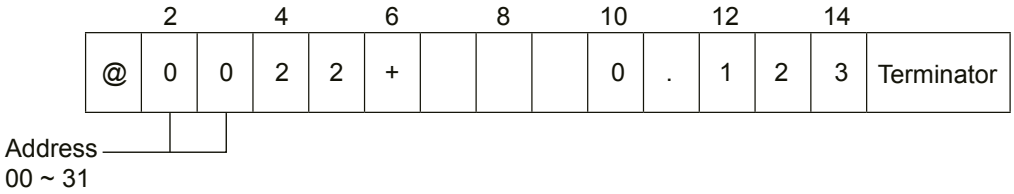
For command Nos. 20 to 23

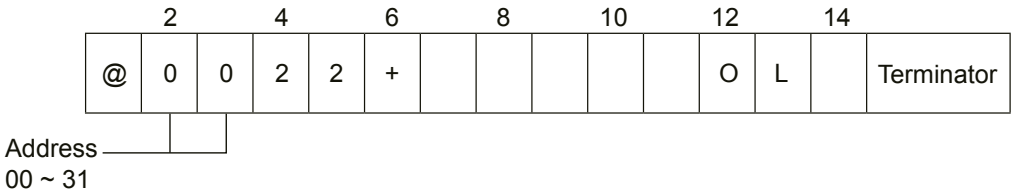


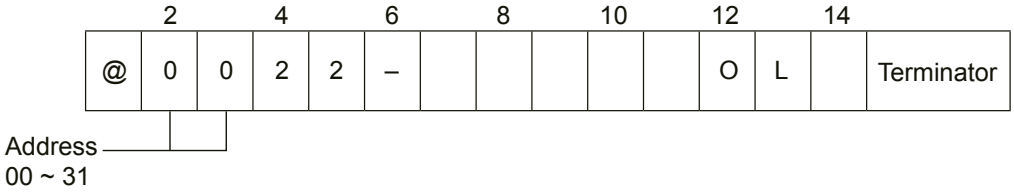
Return (device → Host)



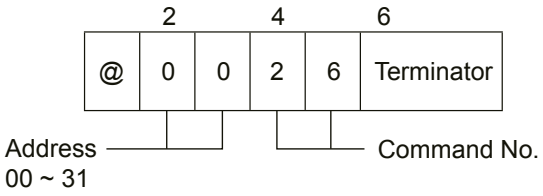




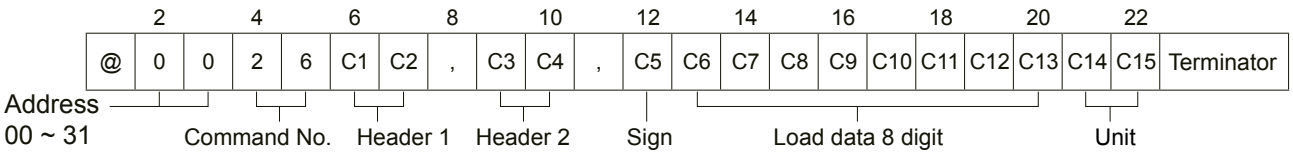




For command No. 26

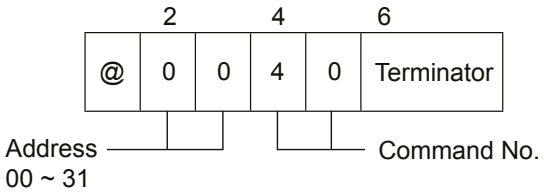


Return (device → Host)

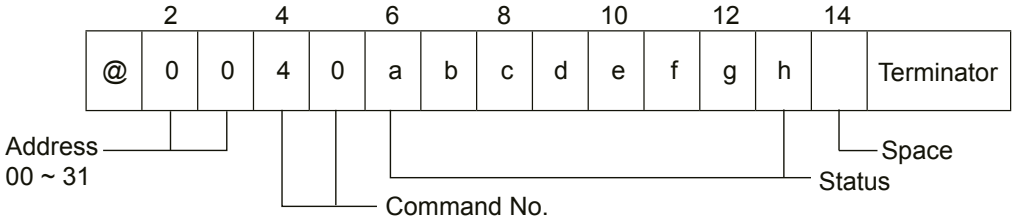


Header 1			Header 2			Sign		Load data (8 digits)								Unit		
C1	C2	Description	C3	C4	Description	C5	Description	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	Description
O	L	Overload	N	T	Net weight	+	Plus						1	2	3		g	Gram
S	T	Stable	G	S	Gross weight	-	Minus				0	.	1	2	3	k	g	Kilogram
U	S	Unstable											O	L			t	Ton
																l	b	Pound
																	N	Newton
																k	N	Kilonewton

20.4.1.2 Reading out condition 1 (Host → device)

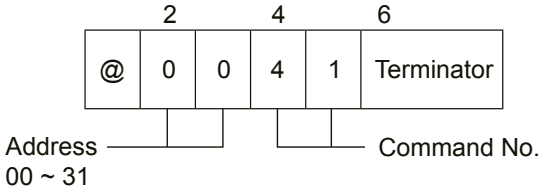


Return (device → Host)

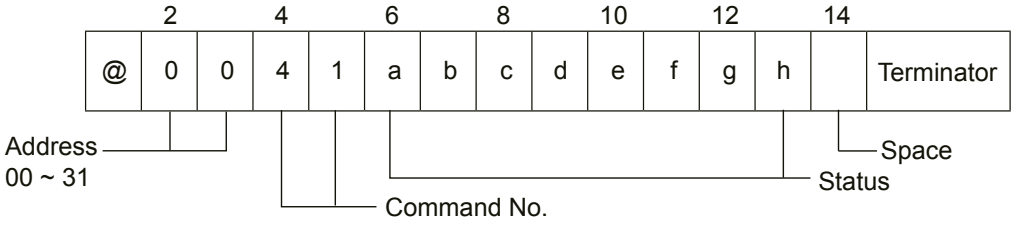


a: Gross weight	b: Net weight
c: Tare	d: Fixed tare
e: Stable	f: HOLD
g: Z-ERR	h: RUN
[1] = ON, [0] = OFF	

20.4.1.3 Reading out condition 2 (Host → device)

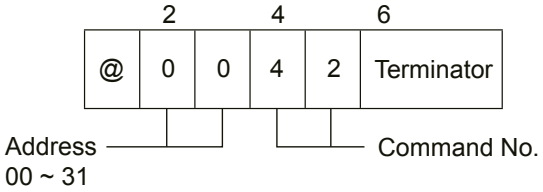


Return (device → Host)

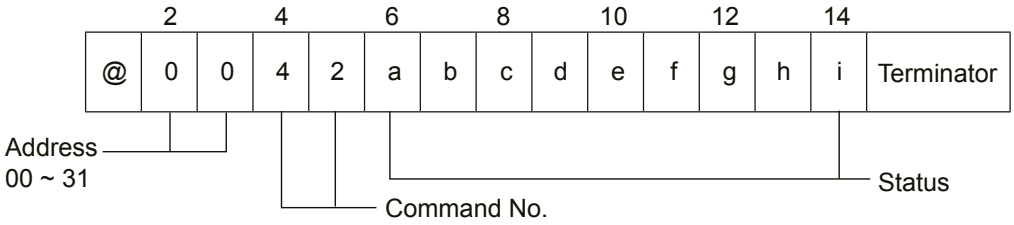


a: F. FLOW	b: M. FLOW
c: D. FLOW	d: OVER
e: OK	f: UNDER
g: FULL	h: ZERO BAND
[1] = ON, [0] = OFF	

20.4.1.4 Reading out condition 3 (Host → device)



Return (device → Host)



a: MIXTURE	b: DISCHARGE (GATE CLOSE)
c: INFLOW FINISH	d: SERVO ERROR
e: DISCHARGE FINISH	f: MIXING FINISH
g: NOZZLE DOWN (INSERT) [1] = ON, [0] = OFF	h: DURING MEASUREMENT
i: WEIGHING SEQ. ERROR	i: Measurement sequence error

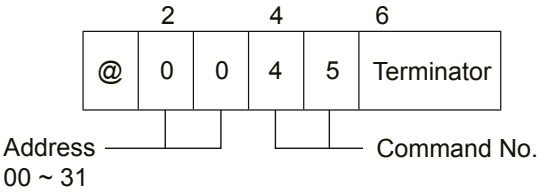
The servo error number 1 to 7 is set in [d].

For information about servo errors, refer to Chapter 19.3.

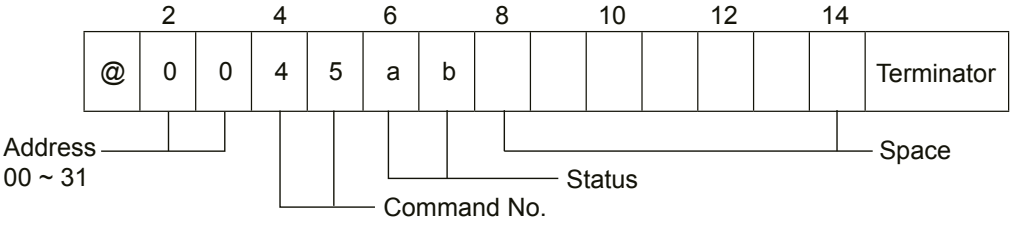
The sequence error number 1 to < is set in [i].

For information about sequence errors, refer to Chapter 19.2.3.

20.4.1.5 Reading out condition 4 (Host → device)

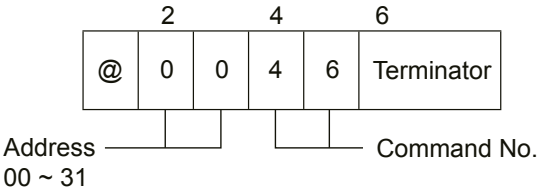


Return (device → Host)

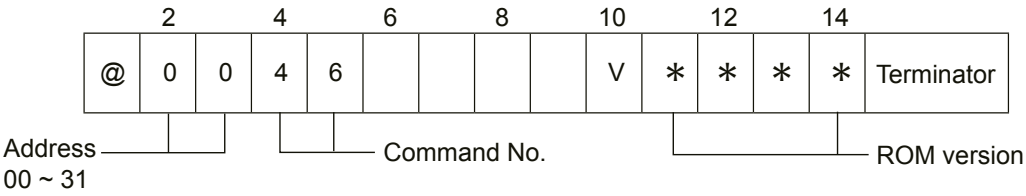


a: Calibration mode	[0] = DURING MEASUREMENT, [1] = DURING ZERO CALIBRATION, [2] = DURING SPAN CALIBRATION
b: Calibration error	[0] = None [1] = Occurrence of ERROR

20.4.1.6 Reading out ROM Version (Host → device)



Return (device → Host)

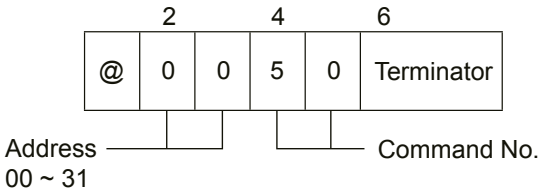


*V1000 indicates ROM version 1.000.

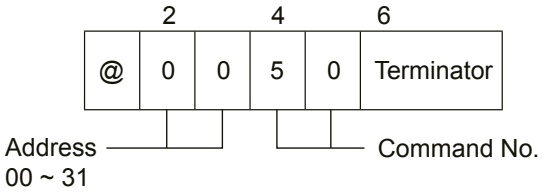
20.4.1.7 Status change (Host → device)

Command No.	Operation
50	GROSS
51	NET
52	ZERO SET
53	ZERO CLEAR

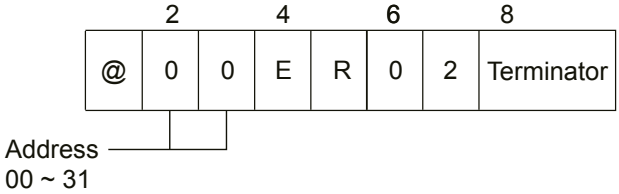
Command No.	Operation
54	TARE
55	TARE CLEAR
56	INFLOW START
57	RECIPE START
58	DISCHARGE START
59	MIXING START
5A	PAUSE
5B	RESTART
5C	ACCUM. COMMAND
5D	FOMER ACM. DATA CLR.
5E	BRAND CODE ACCUM CLR
5F	ALL BRAND CODE ACCUM CLR
5I	ERROR RESET
5J	FORCED BATCH FINISH



Return under normal operation (device → Host)



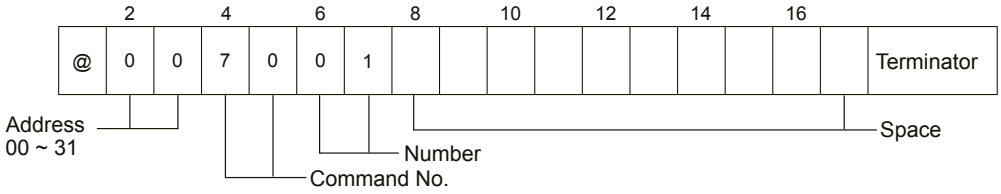
Return under abnormal operation (device → Host)



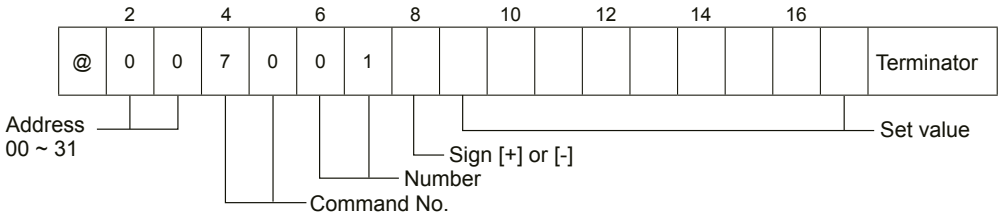
Note:

- The error transmission condition is as follows:
- When executing command No. 51 (net weight display), tare weight is not executed and cannot be changed to net weight.
- When executing command No. 52 (zero set), zero set cannot be executed outwith the effective range.
- When executing command No. 54 (tare weight), tare weight cannot be executed with display ±OL.
- When executing command 5C (ACCUM COMMAND), accumulation cannot be executed due to accumulated value overflow.

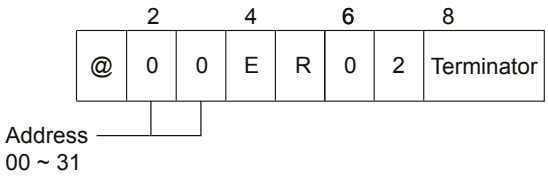
20.4.1.8 Reading out set values (Host → device)



Return under normal operation. (device → Host)



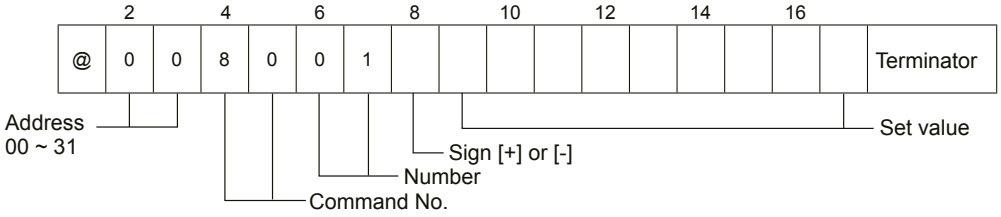
Return under abnormal conditions (when the corresponding number does not exist). (device → Host)



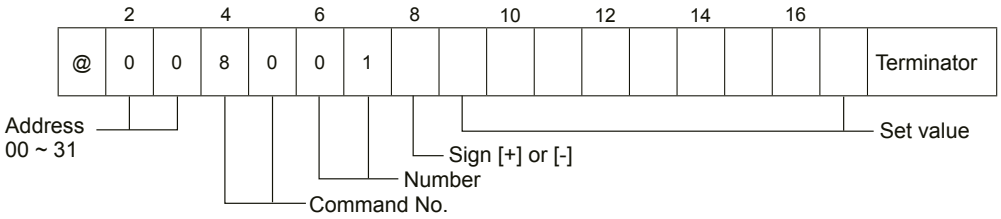
Note:

The setting value is an integer value without a decimal point in the units described in Chapter 20.4.1.12.

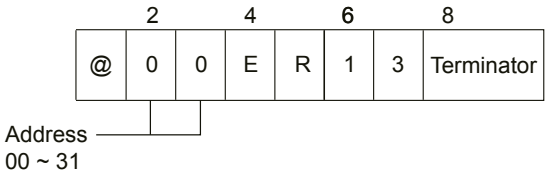
20.4.1.9 Writing set values (Host → device)



Return under normal operation (device → host)



Return under abnormal conditions (For different set value ranges) (device → host)

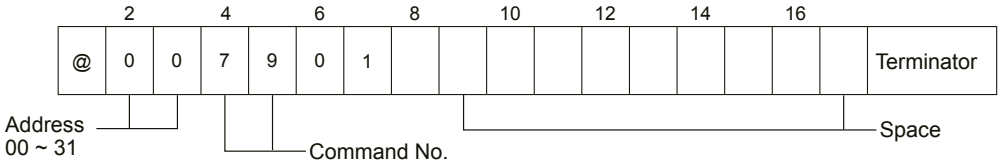


Note:

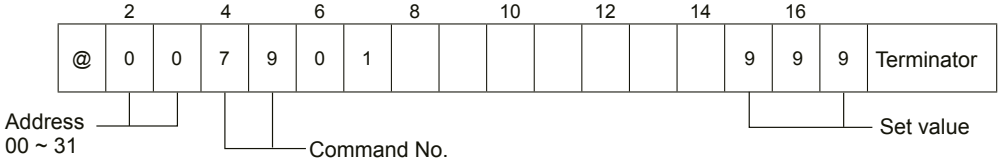
- The command number during write writing changes from [7*,] to [8 *], see Chapter 20.4.1.12.
- The setting value is an integral value without a decimal point in the units described in Chapter 20.4.1.12.

20.4.1.10 Reading out graph display data

Reading weighing time

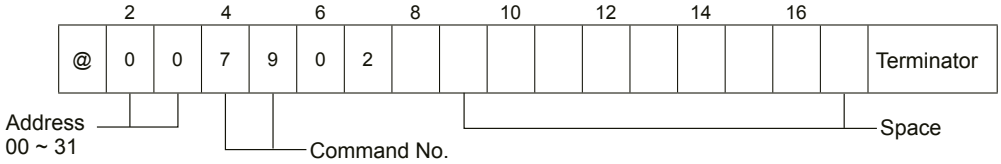


Return

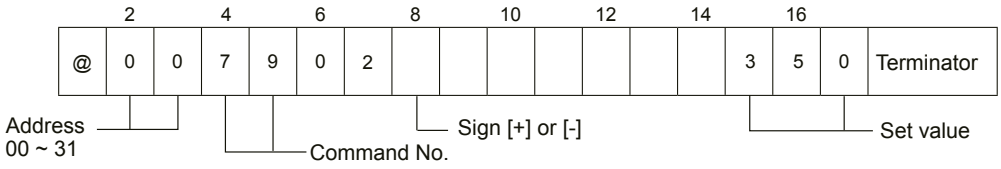


- The unit is fixed to 0.1 second.

Weighing point number

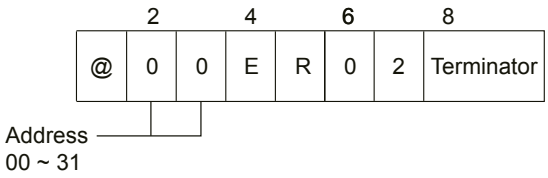


Return (device → Host)

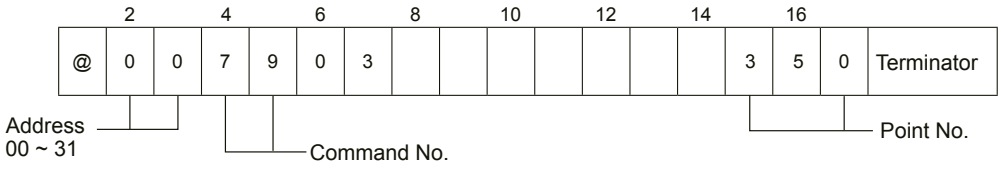


- The range of setting value is from 0 to 350.

Return in abnormal conditions. (device → Host)

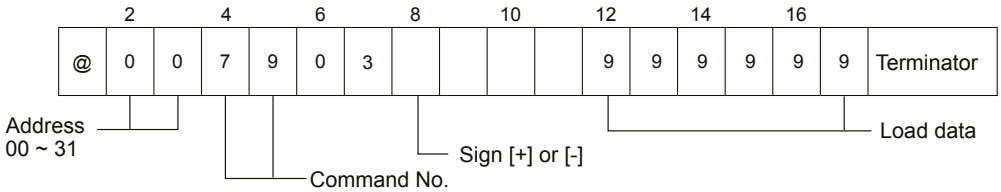


Reading weighing data of weighing point.



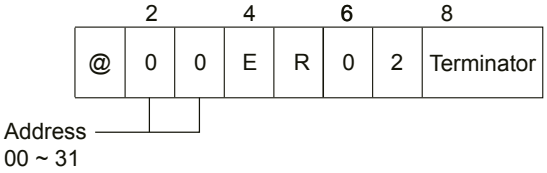
- Point No. range: 0 to 350
- No decimal point is added.

Return under abnormal conditions (device → Host)

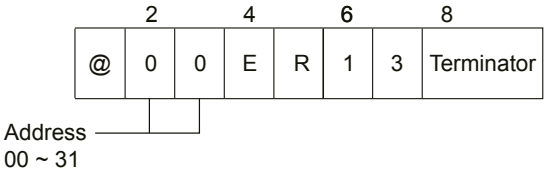


- Setting value range: -999 999 to 999 999
- The setting value is entered from the right for data transmission.
- No decimal point is added.

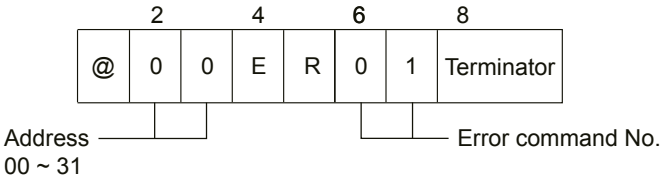
Return under abnormal conditions (reading during weighing) (device → Host)



Return under abnormal conditions (read data is greater than weighing points) (device → Host)



20.4.1.11 Error commands



Command No.	Name	Content
01	Command cannot be executed error status	Unconditionally replies when a command is received other than during weighing (Corresponding command is not judged.)
02	Other errors, depending on the command	At zero set error
10	Parity error	Parity error
11	Framing error	Stop bit detection error
12	Overrun error	Reading error
13	Data code error, data length error	The section below the command number is different from the condition.
14	No appropriate command	Process with no appropriate command number

Note:

- The error command is not returned if the address and completion code (terminator) cannot be detected.
- Dealing with this on the host side if the communication error command is returned from the device.
- Values are entered from the right.
- Set the number of characters for command setting section to 15 characters during reading/writing [BRAND]
- Sending error condition is as follows:
  - There is a disagreement in scale interval.
  - Characters other than numerical values are input for the set value.
  - Characters other than [+] or [–] are set under sign.

20.4.1.12 Read command list

Item name	Command name	Command	No.	Return command setting value
BRAND setting	BRAND CODE	70	01	0 to 99
	NAME	70	02	Katakana, alphanumerical values (15 characters)
	BRAND Hopper No.	70	03	0 to 99
	FINAL	70	04	0 to 999 999
	FREE FALL	70	05	-99 999 to 999 999
	PRELIMINARY1	70	06	0 to 999 999
	PRELIMINARY2	70	07	0 to 999 999
	OVER	70	08	0 to 999 999
	UNDER	70	09	0 to 999 999
	ZERO BAND	70	10	0 to 999 999
	FULL	70	11	0 to 999 999
	A. F.F. COMPENSATION	70	12	-0 to 999 999, 0: A. F. F. COMPENSATION OFF
	SUPPLEMENTARY FLOW TIME	70	13	0.00 s to 99.99 s (Unit: 0.01 s)
	JUDGE. AFTER S-FLOW WAIT	70	14	0.00 s to 99.99 s (Unit: 0.01 s)
	BRAND ACCUM. VALUE (8 digits)	70	15	-99 999 999 to 99 999 999
	BRAND ACCUM. COUNT	70	16	0 to 999 999
	PRESET TARE	70	17	0 to 999 999
	INITIAL FULL FLOW	70	18	0 to 999 999

Item name	Command name	Command	No.	Return command setting value
	INITIAL MEDIUM FLOW	70	19	0 to 999 999
	VALID BRAND CODE	70	20	0 to 99
	BRAND ACCUM. VALUE (10 digits)	70	21	-9 999 999 999 to 9 999 999 999
RECIPE setting	RECIPE CODE	76	01	0 to 99
	NAME	76	02	Katakana, alphanumerical values (15 characters)
	MEAS. 1	76	03	Value from 0 to 99 when selected, -1 when not selected
	MEAS. 2	76	04	Value from 0 to 99 when selected, -1 when not selected
	MEAS. 3	76	05	Value from 0 to 99 when selected, -1 when not selected
	MEAS. 4	76	06	Value from 0 to 99 when selected, -1 when not selected
	MEAS. 5	76	07	Value from 0 to 99 when selected, -1 when not selected
	MEAS. 6	76	08	Value from 0 to 99 when selected, -1 when not selected
	MEAS. 7	76	09	Value from 0 to 99 when selected, -1 when not selected
	MEAS. 8	76	10	Value from 0 to 99 when selected, -1 when not selected
	MEAS. 9	76	11	Value from 0 to 99 when selected, -1 when not selected
	MEAS. 10	76	12	Value from 0 to 99 when selected, -1 when not selected
	RECIPE ACCUM. VALUE (8 digits)	76	13	-99 999 999 to 99 999 999
	RECIPE ACCUM. COUNT	76	14	0 to 999 999
	VALID RECIPE CODE	76	15	0 to 99
	RECIPE ACCUM. VALUE (10 digits)	76	16	-9 999 999 999 to 9 999 999 999
4 step check setting	BRAND CODE	70	01	0 to 99
	NAME	70	02	Katakana, alphanumerical values (15 characters)
	S1	70	04	-999 999 to 999 999
	S2	70	07	-999 999 to 999 999
	S3	70	06	-999 999 to 999 999
	S4	70	05	-999 999 to 999 999

Item name	Command name	Command	No.	Return command setting value
	ZERO BAND	70	10	0 to 999 999
	FULL	70	11	0 to 999 999
	BRAND ACCUM. VALUE (8 digits)	70	15	-99 999 999 to 99 999 999
	BRAND ACCUM. COUNT	70	16	0 to 999 999
	BRAND ACCUM. VALUE (10 digits)	70	21	-9 999 999 999 to 9 999 999 999
	TARGET OF S1 OPERATION	70	31	1: [GROSS], 2: [NET]
	TARGET OF S2 OPERATI-ON	70	32	1: [GROSS], 2: [NET]
	TARGET OF S3 OPERATI-ON	70	33	1: [GROSS], 2: [NET]
	TARGET OF S4 OPERATI-ON	70	34	1: [GROSS], 2: [NET]
	CONDITION OF S1	70	41	1: [MORE THAN], 2: [LESS THAN]
	CONDITION OF S2	70	42	1: [MORE THAN], 2: [LESS THAN]
	CONDITION OF S3	70	43	1: [MORE THAN], 2: [LESS THAN]
	CONDITION OF S4	70	44	1: [MORE THAN], 2: [LESS THAN]
Basic function setting	DISP. REFRESH RATE	71	01	1: [4 TIMES/s], 2: [20 TIMES/s]
	A/D SAMPLING RATE	71	02	1: [10 TIMES/s], 2: [20 TIMES/s], 3: [50 TIMES/s], 4: [100 TIMES/s], 5 [: 200 TIMES/s], 6: [1 000 TIMES/s]
	ANALOG FILTER	71	03	1: [2 Hz], 2: [4 Hz], 3: [6 Hz], 4: [8 Hz], 5: [10 Hz], 6: [100 Hz]
	DIGITAL FILTER	71	04	1 time to 256 times (Unit: times)
	STABILIZATION FILTER	71	05	1 time to 256 times (Unit: times)
	STAB. FILTER TIME	71	06	0.0 s to 9.9 s (Unit: 0.1 s)
	STAB. FILTER BAND	71	07	0.00 to 99.9 Unit: 0.1 d)
	STAB. DETECTION TIME	71	08	0.0 s to 9.9 s (Unit: 0.1 s)
	STAB. DETECTION BAND	71	09	0.00 to 99.9 Unit: 0.1 d)
	OPERATION OF ZERO	71	10	1: [IN STABLE MODE], 2: [ANY TIME]
	RANGE OF ZERO	71	11	0 % to 30 % (Unit: %)
	ZERO TRACKING TARGET	71	12	1: [GROSS/NET], 2: [GROSS]
	ZERO TRACKING TIME	71	13	0.0 s to 9.9 s (Unit: 0.1 s)
	ZERO TRACKING BAND	71	14	0.0 d to 9.9 d (Unit: 0.1 d)
	OPERATION OF TARE	71	15	1: [IN STABLE MODE], 2: [ANY TIME], 3: [NET WEIGHT OFFSET OP.]

Item name	Command name	Command	No.	Return command setting value
	RANGE OF TARE	71	16	1: [0 < LOAD ≤ WEIGHING CAPACITY], 2: [LOAD ≤ ?WEIGHING CAPACITY?]
	OPERATION OF PRE. TARE	71	17	1: [VALID], 2: [INHIBIT]
	Preset tare = 0 choice	71	18	1:[THE LAST TARE IS USED], 2: [TARE CLEAR]
	ZERO AT POWER ON	71	19	1: [VALID], 2: [INHIBIT]
	ZERO CLR. AT POWER ON	71	20	1: [VALID], 2: [INHIBIT]
	TARE AT POWER ON	71	21	1: [VALID], 2: [INHIBIT]
	TARE CLR. AT POWER ON	71	22	1: [VALID], 2: [INHIBIT]
	HOLD OPERATION	71	23	1: [SYNC. WITH HOLD], 2: [SYNC. WITH INFLOW FIN.], 3: [SYNC. WITH RECIPE FIN.]
	ACCUM. COMMAND	71	24	1: [IN STABLE MODE], 2: [ANY TIME]
	PRINT COMMAND	71	25	1: [IN STABLE MODE], 2: [ANY TIME]
	GRAPH TRIGGER SETTING	71	26	1: [SINGLE], 2: [START+LEVEL↑], 3: [START+LEVEL↑↓], 4: [LEVEL↑], 5: [LEVEL↑↓], 6: [INFLOW START LINKED], 7: [RECIPE START LINKED]
	GRAPHIC TRIGGER LEVEL	71	27	-999 999 to 999 999
	SCREEN SELECTION	71	28	1: [STANDARD], 2: [STANDARD/SIMPLE]
	STABILITY OPERATION	71	29	1: [ANY TIME], 2: [WEIGHING SCREEN ONLY]
	COMPARATIVE RESULT HOLD	71	31	1: [VALID], 2: [INHIBIT]
	S-I/F HOLD	71	32	1: [VALID], 2: [INHIBIT]
	CC-Link HOLD	71	33	1: [VALID], 2: [INHIBIT]
	LOAD DISPLAY VALUE HOLD	71	34	1: [VALID], 2: [INHIBIT]
	NET WEIGHT SIGN INVER-SE	71	35	1: [VALID], 2: [INHIBIT]

Note:

- To use commands for [NAME] and [NAME], input 15 characters under command setting value.
- For the write command, regard the command numbers 70 and 76 in the table as 80 and 86, respectively.
- For the write command, regard the command number 70 in the table as 80.
- For the write command, regard the command number 71 in the table as 81.

Item name		Command name	Command	No.
I/O setting	F1 to F4 keys	F1 key function	72	02
		F2 key function	72	03
		F3 key function	72	04
		F4 key function	72	05
		Return command setting value		
		1: [OFF], 2: [PRINT], 3: [ZERO CLEAR], 4: [TARE CLEAR], 5: [INFLOW START], 6: [RECIPE START], 7: [DISCHARGE START], 8: [MIXING START], 9: [PAUSE], 10: [RESTART], 11: [FORCED INFLOW FINISH], 12: [FORCED RECIPE FINISH], 13: [FORCED DISCH. FINISH], 14: [ACCUM. COMMAND], 15: [FOMER ACM. DATA CLR.], 16: [M. F. F. COMPENSATION], 17: [ERROR RESET], 18: [CLR ACM. OF BRAND], 19: [CLR ACM. OF RECIPE], 20: [CLR ACM. OF ALL BRAND], 21: [CLR ACM. OF ALL RECIPE], 22: [HOLD]		
	I/O input	**Command name**	**Command**	**No.**
		I/O INPUT1	72	11
		I/O INPUT2	72	12
		I/O INPUT3	72	13
		I/O INPUT4	72	14
		I/O INPUT5	72	15
		I/O INPUT6	72	16
		I/O INPUT7	72	17
		I/O INPUT8	72	18
		I/O INPUT9	72	19
		I/O INPUT10	72	20
		I/O INPUT11	72	21
		Return command setting value		
		1: [OFF], 2: [GROSS/NET], 3: [ZERO], 4: [ZERO CLEAR], 5: [TARE], 6: [TARE CLEAR], 7: [INFLOW START], 8: [RECIPE START], 9: [DISCHARGE START], 10: [MIXING START], 11: [INFLOW/DISCHARGE], 12: [M. F. F. COMPENSATION], 13: [ACCUM. COMMAND], 14: [FOMER ACM. DATA CLR.], 15: [CODE NO. 1], 16: [CODE NO. 2], 17: [CODE NO. 4], 18: [CODE NO. 8], 19: [CODE NO. 10], 20: [CODE NO.] 20, 21: [CODE NO. 40], 22: [CODE NO. 80], 23: [PAUSE], 24: [RESTART], 25: [CLR ACM. OF BRAND], 26: [CLR ACM. OF ALL BRAND], 27: [CLR ACM. OF RECIPE], 28: [CLR ACM. OF ALL RECIPE], 29: [SAFETY INPUT1], 30: [SAFETY INPUT2], 31: [SAFETY INPUT3], 32: [SAFETY INPUT4], 33: [SAFETY INPUT5], 34: [SAFETY INPUT6], 35: [SAFETY IN-PUT7], 36: [SAFETY INPUT8], 37: [FORCED INFLOW FINISH], 38: [FORCED RECIPE FINISH], 39: [FORCED DISCH. FINISH], 40: [MANUAL FULL FLOW], 41: [MANUAL MEDIUM FLOW], 42: [MANUAL DRIBBLE FLOW], 43: [MANUAL DISCHARGE] 44: [MANUAL MIXING], 45: [ERROR RESET], 46: [PRINT COMMAND], 47: [HOLD], 48: [IN. FOR SIMILAR OUT.]		
I/O setting	I/O output	I/O OUTPUT1	72	31

Item name	Command name	Command	No.
	I/O OUTPUT2	72	32
	I/O OUTPUT3	72	33
	I/O OUTPUT4	72	34
	I/O OUTPUT5	72	35
	I/O OUTPUT6	72	36
	I/O OUTPUT7	72	37
	I/O OUTPUT8	72	38
	I/O OUTPUT9	72	39
	I/O OUTPUT10	72	40
	I/O OUTPUT11	72	41
	Return command setting value		
	1: [OFF], 2: [STABLE], 3: [ZERO BAND], 4: [FULL], 5: [F. FLOW], 6: [M. FLOW], 7: [D. FLOW], 8: [OVER], 9: [OK], 10: [UNDER], 11: [MIXING], 12: [DISCHARGE (GATE OPEN)], 13: [INFLOW FINISH], 14: [RECIPE FINISH], 15: [DISCHARGE FINISH], 16: [MIXING FINISH], 17: [NOZZLE DOWN (INSERT)], 18: [MEAS.], 19: [WEIGHING SEQ. ERROR], 20: [CAP. EXCEEDED ERROR], 21: [ERROR], 22: [DURING TARE], 23: [CENTER OF ZERO], 24: [GROSS DISPLAY], 25: [NET DISPLAY], 26: [DURING HOLD], 27: [HOPPER1], 28: [HOPPER2], 29: [HOPPER3], 30: [HOPPER4], 31: [HOPPER5], 32: [HOPPER6], 33: [HOPPER7], 34: [HOPPER8], 35: [HOPPER9], 36: [HOPPER10], 37: [HOPPER11], 38: [HOPPER12], 39: [HOPPER13], 40: [HOPPER14], 41: [HOPPER15], 42: [HOPPER16], 43: [HOPPER17], 44: [HOPPER18], 45: [HOPPER19], 46: [HOPPER20], 47: [HOPPER1 FULL FLOW], 48: [HOPPER1 MEDIUM FLOW], 49: [HOPPER1 DRIBBLE FLOW], 50: [HOPPER2 FULL FLOW], 51: [HOPPER2 MEDIUM FLOW], 52: [HOPPER2 DRIBBLE FLOW], 53: [HOPPER3 FULL FLOW], 54: [HOPPER3 MEDIUM FLOW], 55: [HOPPER3 DRIBBLE FLOW], 56: [HOPPER4 FULL FLOW], 57: [HOPPER4 MEDIUM FLOW], 58: [HOPPER4 DRIBBLE FLOW], 59: [HOPPER5 FULL FLOW], 60: [HOPPER5 MEDIUM FLOW], 61: [HOPPER5 DRIBBLE FLOW], 62: [HOPPER6 FULL FLOW], 63: [HOPPER6 MEDIUM FLOW], 64: [HOPPER6 DRIBBLE FLOW], 65: [HOPPER7 FULL FLOW], 66: [HOPPER7 MEDIUM FLOW], 67: [HOPPER7 DRIBBLE FLOW], 68: [HOPPER8 FULL FLOW], 69: [HOPPER8 MEDIUM FLOW], 70: [HOPPER8 DRIBBLE FLOW], 71: [HOPPER9 FULL FLOW], 72: [HOPPER9 MEDIUM FLOW], 73: [HOPPER9 DRIBBLE FLOW], 74: [HOPPER10 FULL FLOW], 75: [HOPPER10 MEDIUM FLOW], 76: [HOPPER10 DRIBBLE FLOW], 77: [IN. SIMILARTY OUT.]		

Note:

- For the write command, regard the command number 72 in the table as 82.

Item name	Command name	Command	No.	Return command setting value
I/O setting	ZERO KEYLOCK	72	51	1: [VALID], 2: [INHIBIT]
	GROSS/NET KEYLOCK	72	52	1: [VALID], 2: [INHIBIT]

Item name	Command name	Command	No.	Return command setting value
	TARE KEY LOCK	72	53	1: [VALID], 2: [INHIBIT]
	BRAND CODE KEYLOCK	72	54	1: [VALID], 2: [INHIBIT]
	F-KEYLOCK	72	55	1: [VALID], 2: [INHIBIT]
	MENU KEYLOCK	72	56	1: [VALID], 2: [INHIBIT]
	CALIBRATION KEYLOCK	72	57	1: [VALID], 2: [INHIBIT]
	I/O OUTPUT LOGIC (output 1 to 7)	72	61	1: [NEGATIVE LOGIC], 2: [POSITIVE LOGIC] 10^0 digits: I/O output 1 operation 10^1 digits: I/O output 2 operation 10^3 digits: I/O output 3 operation 10^4 digits: I/O output 4 operation 10^5 digits: I/O output 5 operation 10^6 digits: I/O output 6 operation 10^7 digits: I/O output 7 operation
	I/O OUTPUT LOGIC (output 8 to 11)	72	62	1: [NEGATIVE LOGIC], 2: [POSITIVE LOGIC] 10^0 digits: I/O output 8 operation 10^1 digits: I/O output 9 operation 10^3 digits: I/O output 10 operation 10^4 digits: I/O output 11 operation
Weighing operation setting	WEIGHING MODE	73	01	1: [SIMPLE COMPARATIVE], 2: [SEQUENTIAL MODE], 3: [4 STEP COMPARATOR]
	CONTROL MODE	73	02	1: [INFLOW MODE], 2: [DISCHARGE MODE], 3: [EXTERNAL]
	COMPARISION (Operation of OVER, OK and UNDER)	73	03	1: [ANY TIME], 2: [IN STABLE MODE], 3: [AT INFLOW FINISH], 4: [HOLD AT INFLOW FINISH]
	COMP. OF ZERO BAND	73	04	1: [GROSS], 2: [NET], 3: [COMPARISION OFF], 4: [?GROSS?], 5: [?NET?]
	FULL COMPARISON	73	05	1: [GROSS], 2: [NET], 3: [COMPARISION OFF], 4: [?GROSS?], 5: [?NET?]
	RECIPE MODE	73	06	1: [INHIBIT], 2: [SEMI-AUTO. RECIPE MODE], 3: [AUTO. RECIPE MODE]
	SAVE THE A. F. F.	73	07	1: [NO MEMORIZE], 2: [MEMORIZE]
	INFLOW SAFETY CHECK			
	SAFETY CHECK1	73	11	1: [ON], 2: [OFF]
	SAFETY CHECK2	73	12	1: [ON], 2: [OFF]
	SAFETY CHECK3	73	13	1: [ON], 2: [OFF]
	SAFETY CHECK4	73	14	1: [ON], 2: [OFF]

Item name	Command name	Command	No.	Return command setting value
	SAFETY CHECK5	73	15	1: [ON], 2: [OFF]
	SAFETY CHECK6	73	16	1: [ON], 2: [OFF]
	SAFETY CHECK7	73	17	1: [ON], 2: [OFF]
	SAFETY CHECK8	73	18	1: [ON], 2: [OFF]
	DISCH. SAFETY CHECK			
	SAFETY CHECK1	73	21	1: [ON], 2: [OFF]
	SAFETY CHECK2	73	22	1: [ON], 2: [OFF]
	SAFETY CHECK3	73	23	1: [ON], 2: [OFF]
	SAFETY CHECK4	73	24	1: [ON], 2: [OFF]
	SAFETY CHECK5	73	25	1: [ON], 2: [OFF]
	SAFETY CHECK6	73	26	1: [ON], 2: [OFF]
	SAFETY CHECK7	73	27	1: [ON], 2: [OFF]
	SAFETY CHECK8	73	28	1: [ON], 2: [OFF]
	RECIPE SAFETY CHECK			
	SAFETY CHECK1	73	31	1: [ON], 2: [OFF]
	SAFETY CHECK2	73	32	1: [ON], 2: [OFF]
	SAFETY CHECK3	73	33	1: [ON], 2: [OFF]
	SAFETY CHECK4	73	34	1: [ON], 2: [OFF]
	SAFETY CHECK5	73	35	1: [ON], 2: [OFF]
	SAFETY CHECK6	73	36	1: [ON], 2: [OFF]
	SAFETY CHECK7	73	37	1: [ON], 2: [OFF]
	SAFETY CHECK8	73	38	1: [ON], 2: [OFF]
	MIXING SAFETY CHECK			
	SAFETY CHECK1	73	41	1: [ON], 2: [OFF]
	SAFETY CHECK2	73	42	1: [ON], 2: [OFF]
	SAFETY CHECK3	73	43	1: [ON], 2: [OFF]
	SAFETY CHECK4	73	44	1: [ON], 2: [OFF]
	SAFETY CHECK5	73	45	1: [ON], 2: [OFF]
	SAFETY CHECK6	73	46	1: [ON], 2: [OFF]
	SAFETY CHECK7	73	47	1: [ON], 2: [OFF]
	SAFETY CHECK8	73	48	1: [ON], 2: [OFF]
	GENERAL SAFETY CHECK			
	SAFETY CHECK1	73	51	1: [ON], 2: [OFF]
	SAFETY CHECK2	73	52	1: [ON], 2: [OFF]
	SAFETY CHECK3	73	53	1: [ON], 2: [OFF]

Item name	Command name	Command	No.	Return command setting value
	SAFETY CHECK4	73	54	1: [ON], 2: [OFF]
	SAFETY CHECK5	73	55	1: [ON], 2: [OFF]
	SAFETY CHECK6	73	56	1: [ON], 2: [OFF]
	SAFETY CHECK7	73	57	1: [ON], 2: [OFF]
	SAFETY CHECK8	73	58	1: [ON], 2: [OFF]
	AUTOMATIC ACCUM.	73	61	1: [OFF], 2: [SYNC. WITH FINISH], 3: [AUTO ACCUM. AT STABLE]
	CONDITION OF AUTO ACM.	73	62	1: [IN OK MODE], 2: [NO CONDITION]
	AUTO RECIPE CODE ACM.	73	63	1: [VALID], 2: [INHIBIT]
	AUTOMATIC PRINT	73	64	1: [VALID], 2: [INHIBIT]
Sequence control setting	Signal operation of IN-FLOW start			
	START ABOVE ZERO BAND	74	01	1: [VALID], 2: [INHIBIT]
	AUTOMATIC TARE	74	02	1: [VALID], 2: [INHIBIT]
	NOZZLE OPERATION			
	NOZZLE CONTROL	74	03	1: [VALID], 2: [INHIBIT]
	CONTACT STOP SEQUENCE	74	04	1: [VALID], 2: [INHIBIT]
	UP AFTER COMPENSATION	74	05	1: [VALID], 2: [INHIBIT]
	JUDGE CONDITION	74	06	1: [TIMER IS UP], 2: [STAB. AND TIMER IS UP], 3: [STAB. OR TIMER IS UP]
	Inflow finish action			
	MIXING START	74	07	1: [VALID], 2: [INHIBIT]
	DISCHARGE START	74	08	1: [VALID], 2: [INHIBIT]
	DISCH. FINISH ACTIONS			
	TARE CLEAR	74	09	1: [VALID], 2: [INHIBIT]
	MIXING START	74	10	1: [VALID], 2: [INHIBIT]
	RECIPE START ACTIONS			
	RECIPE START ACTIONS	74	11	1: [VALID], 2: [INHIBIT]
	RECIPE FINISH ACTIONS			
	TARE CLEAR	74	12	1: [VALID], 2: [INHIBIT]
	MIXING START	74	13	1: [VALID], 2: [INHIBIT]
	DISCHARGE START	74	14	1: [VALID], 2: [INHIBIT]

Item name	Command name	Command	No.	Return command setting value
	MAX TIME OF COMPENSATION	74	15	0 time to 255 times, 0: OFF (Unit: times)
	COMPARISON FLOW EVAL	74	16	1: [TIMER IS UP], 2: [STAB. AND TIMER IS UP], 3: [STAB. OR TIMER IS UP]
	A. F.F. COMPENSATION	74	17	1: [VALID], 2: [INHIBIT]
	INFLOW FINISH OUTPUT OFF	74	18	1:[NO CONDITION], 2: [OL OR UNSTABLE], 3: [ZERO BAND]
	TARE INFLOW START DELAY	74	21	1: [VALID], 2: [INHIBIT]
	INFLOW MONITORING TIMER	74	22	0 s to 9 999 s (Unit: s)
	INFLOW START DELAY TIMER	74	23	0 s to 9 999 s (Unit: s)
	F-FLOW COMP. STOP TIMER	74	24	0.00 s to 99.99 s (Unit: 0.01 s)
	M-FLOW COMP. STOP TIMER	74	25	0.00 s to 99.99 s (Unit: 0.01 s)
	D-FLOW COMP. STOP TIMER	74	26	0.00 s to 99.99 s (Unit: 0.01 s)
	WAITING TIME FOR JUDGE.	74	27	0.00 s to 99.99 s (Unit: 0.01 s)
	DISCH. MONI. TIMER	74	28	0 s to 9,999 s 0: OFF (Unit: s)
	DCHG-GATE CLOSE DELAY	74	29	0.00 s to 99.99 s (Unit: 0.01 s)
	IINFLOW FINISH OUTPUT ON	74	30	0.00 s to 99.99 s (Unit: 0.01 s)
	DISCH. FINISH OUTPUT ON	74	31	0.00 s to 99.99 s (Unit: 0.01 s)
	RECIPE FINISH OUTPUT ON	74	32	0.00 s to 99.99 s (Unit: 0.01 s)
	MIXING FINISH OUTPUT ON	74	33	0.00 s to 99.99 s (Unit: 0.01 s)
	MIXING TIME OUTPUT ON	74	34	0 s to 9 999 s (Unit: s)
Calibration	ZERO ADJUSTMENT	75	01	Non-enterable
	SPAN ADJUSTMENT	75	02	1 to 999 999
	WEIGHING CAPACITY	75	03	1 to 999 999
	DIVISION (scale interval)	75	05	1: [1], 2: [2], 3: [5], 4: [10], 5: [20], 6: [50]
	ZERO POINT mV/V (four decimal places)	75	06	-2.5000 mV/V to 2.5000 mV/V (Unit: 0.0001 mV/V)

Item name	Command name	Command	No.	Return command setting value
	SPAN POINT mV/V (four decimal places)	75	07	-0.0001 mV/V to 3.1000 mV/V (Unit: 0.0001 mV/V)
	DECIMAL POINT	75	11	1: [0], 2: [0.0], 3: [0.00], 4: [0.000], 5: [0.0000]
	Unit	75	12	1: [NONE], 2: [g], 3: [kg], 4: [t], 5: [lb], 6: [N], 7:[kN]
	BRIDGE POWER SUPPLY	75	13	1: [12V], 2: [6V], 3:[3V]
	OL DISPLAY CONDITION	75	14	1: [+9D], 2: [±110%], 3: [-20D to +9D]
	ADJ. GRAV. ACCELERATION	75	21	1: [DISTRICT No.], 2: [GRAVITY ACCELERATION]
	CALIB. PLACE No.	75	22	01 to 16
	OPERATION PLACE No.	75	23	01 to 16
	CALIB. PLACE G. A.	75	24	9.000 to 9.999 (Unit: 0.001 m/s^2)
	OPERATION PLACE G. A.	75	25	9.000 to 9.999 (Unit: 0.001 m/s^2)
	ZERO POINT mV/V (five decimal places)	75	26	-2.50000 mV/V to 2.50000 mV/V (Unit: 0.00001 mV/V)
	SPAN POINT mV/V (five decimal places)	75	27	-0.00001 mV/V to 3.10000 mV/V (Unit: 0.00001 mV/V)

Note:

- For the write command, regard the command number 72 in the table as 82.
- For the write command, regard the command number 73 in the table as 83.
- For the write command, regard the command number 74 in the table as 84.
- For the write command, regard the command number 75 in the table as 85.
- For the write command, regard the command number 76 in the table as 86.
- Set the span calibration value so that [WEIGHING CAPACITY] ≥ [SPAN ADJUSTMENT].
- The same commands can be used to install ≥ to a weighing system that currently uses ZERO POINT mV/V (four decimal places) (No. 06)/SPAN POINT mV/V (four decimal places) (No. 07). To make the correct settings when changing the commands, ZERO POINT mV/V (five decimal places) (No. 26)/SPAN POINT mV/V (five decimal places) (No. 27), be careful with the number of digits.

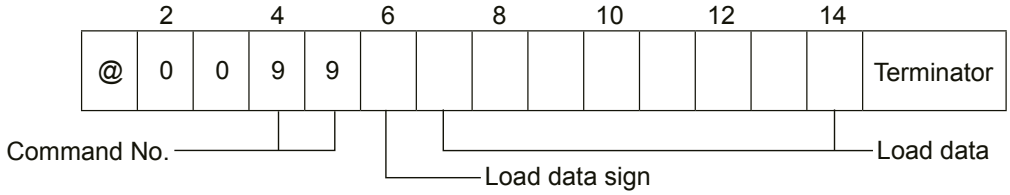
20.4.2 Data formats for (STREAM MODE), (SYNC. WITH PRINT), (SYNC. WITH ACCUM.), (SYNC. WITH FINISH)

Note:

- Load data is entered from the right.
- [–] is entered for negative values and [+] for positive values.
- Zero suppression is performed on the load data.
- A decimal point is added at the specified position if addition of decimal point is set to [YES] and the decimal point is specified on the calibration screen.
- [OL] is displayed on the load data part when there is an overload.
- The blank parts are all spaces.

20.4.2.1 When (TARGET OF STREAM/PRINT) is selected by (LOAD DISPLAY), (GROSS), or (NET)

Return (device → Host)



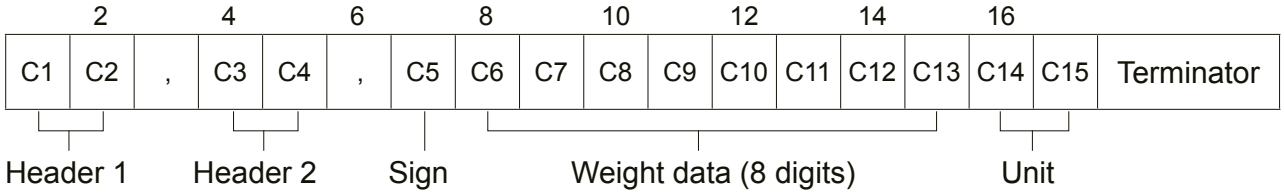
2	4	6	8	10	12	14	
@ 0 0 9 9 –					1	2	3 Terminator

2	4	6	8	10	12	14	
@ 0 0 9 9 +				0 .	1	2	3 Terminator

2	4	6	8	10	12	14	
@ 0 0 9 9 +					O	L	Terminator

2	4	6	8	10	12	14	
@ 0 0 9 9 –					O	L	Terminator

20.4.2.2 When (TARGET OF STREAM/PRINT) is selected by (LOAD DISP. WITH STATE)



Header 1			Header 2			Sign		Load data (8 digits)								Unit		
C1	C2	Description	C3	C4	Description	C5	Description	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	Description
O	L	Overload	N	T	Net weight	+	Plus						1	2	3		g	Gram
S	T	Stable	G	S	Gross weight	-	Minus				0	.	1	2	3	k	g	Kilogram
U	S	Unstable											O	L			t	Ton
																l	b	Pound
																	N	Newton
																k	N	Kilonewton

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