EX200S

OPERATION MANUAL

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2 2 2 CONTENT 2 2 2

CHAPTER 1 MAIN CHARACTERISTICS....4

CHAPTER 2 SPECIFICATIONS....6
2-1 FRONT PANEL....6
2-2 REAR PANEL....9
2-3 A/D CONVERSION....9

CHAPTER 3 INSTALLATION....10
3-1 LOAD CELL....10
3-2 INDICATOR DIMENSIONS & INSTALLATION....10
3-3 POWER SUPPLY....12
3-4 ACCESSORIES....12

CHAPTER 4 OPERATION....13
4-1 FUNCTION CONFIGURATION....13
4-2 BATCH / CHECK VALUE SETTING....14

CHAPTER 5 CALIBRATION....15
5-1 CALIBRATION PROCEDURE....15
5-2 NORMAL CALIBRATION....17
5-3 LINEARITY CALIBRATION....18
5-4 ZERO CALIBRATION....19
5-5 SPAN ADJUSTMENT....19
5-6 INDICATION OF CALIBRATION ERROR....20

CHAPTER 6 BASIC FUNCTION SETUP....21

CHAPTER 7 BATCH AND CODE SELECT MODE....24
7-1 FUNCTION SETTING....24
7-2 EXTERNAL INPUT SIGNAL SETTING....28
7-3 RELAY OUTPUT SIGNAL SETTING....29
7-4 WEIGHING MODE OPERATION....30
7-4-1 NORMAL LOADING BATCH (FUNC. 20 = 0)....30
7-4-2 NORMAL DISCHARGING BATCH (FUNC. 20 = 1)....33
7-4-3 BUILT-IN CHARGING BATCH PROCEDURE (FUNC. 20 = 2)....36
7-4-4 BUILT-IN DISCHARGING BATCH PROCEDURE (FUNC. 20 = 3)....42
7-5 CHECK MODE OPERATION....48
7-5-1 CHECK MODE 1 (FUNC.20 = 4)....48
7-5-2 CHECK MODE 2 (FUNC.20 = 5)....49
7-5-3 CHECK MODE 3 (FUNC.20 = 6)....50
7-5-4 CHECK MODE 4 (FUNC.20 = 7)....51
7-6 NOTES....52

CHAPTER 8 COUNTING, HOLD AND PRESET-TARE MODES....53
8-1 COUNTING MODE....53
8-1-1 DISPLAY....53

8-1-2 UNIT WEIGHT INPUT AND SAMPLING....53
8-1-3 QUANTITY COMPARISON....54
8-2 HOLD MODE....54
8-3 PRESET-TARE MODE....55

CHAPTER 9 INTERFACE....56
9-1 EXTERNAL CONTROL INPUT AND RELAY OUTPUT....56
9-2 RS-232C AND CURRENT LOOP SERIAL INTERFACES....59
9-2-1 PIN POSITION....59
9-2-2 FUNCTION SETTING....60
9-2-3 TRANSMITTING DATA FORMAT....61
9-2-4 COMMAND MODE....63
9-2-5 PROGRAM (EXAMPLE)....65
9-3 INTERFACE RS-422 / RS-485....66
9-3-1 PIN ASSIGNMENTS....66
9-3-2 CONNECTION METHOD....67
9-3-3 FUNCTION SETTING....68
9-3-4 TRANSFER FORMAT....69
9-3-5 COMMAND MODE....69
9-4 BCD PARALLEL OUTPUT INTERFACE....70
9-4-1 PIN POSITION....70
9-4-2 FUNCTION SETTING....72
9-4-3 OUTPUT / INPUT SIGNAL DESCRIPTION....72
9-5 Set-Point Interface....73
9-5-1 INPUT PIN ASSIGNMENT....73
9-5-2 Connection method....73
9-5-3 Function Setting....74
9-6 ANALOGUE CURRENT / VOLTAGE OUTPUT INTERFACE....75
9-6-1 TERMINAL POSITION....75
9-6-2 FUNCTION SETTING....75
9-6-3 OUTPUT SETTING DESCRIPTION....76
9-6-4 VOLTAGE OUTPUT....76

CHAPTER 10 MAINTENANCE....77
10-1 DATA RESTORE FUNCTION CHART....77
10-2 CLEAR BATCH TARGET VALUE....78
10-3 FUNCTION SETTINGS RESTORE TO THE FACTORY DEFAULT VALUES....78
10-4 CLEAR TARE VALUE AND ZERO BALANCE....78
10-5 ALL PARAMETERS RESTORE TO FACTORY STANDARD VALUES....79
10-6 DIAGNOSTIC MODE....79
10-6-1 DIAGNOSTIC FOR 7 SEGMENT DISPLAY AND LED ANNUNCIATORS....80
10-6-2 DIAGNOSTIC FOR KEYBOARD AND CALIBRATION SWITCH....80
10-6-3 DIAGNOSTIC FOR RS-232 SERIAL INTERFACE....80
10-6-4 DIAGNOSTIC FOR CONTROL I/O INTERFACE....80
10-6-5 DIAGNOSTIC FOR BCD PARALLEL OUTPUT INTERFACE....80
10-6-6 DIAGNOSTIC FOR ANALOGUE OUTPUT INTERFACE....81
10-6-7 LOW BATTERY (Memory backup)....81
10-6-8 DIAGNOSTIC FOR CODE NUMBER SELECTION INTERFACE....81
10-7 BATTERY LOW....81

CHAPTER 11 FUNCTION LIST 82
11-1 BASIC FUNCTIONS 82
11-2 WEIGHING FUNCTIONS 85
11-3 EXTERNAL CONTROL OUTPUT SIGNALS 89
11-4 RELAY OUTPUTS 90
11-5 RS-232 & CURRENT LOOP FUNCTIONS 91
11-6 RS-422 / RS-485 INTERFACES FUNCTIONS 92
11-7 BCD OUTPUT INTERFACES FUNCTIONS 93
11-8 SET-POINT INTERFACE FUNCTION 93
11-9 ANALOGUE OUTPUT INTERFACE FUNCTIONS 94

CHAPTER 1 MAIN CHARACTERISTICS

2 HIGH PERFORMANCE A/D CONVERTER

- 0.3μV/d – High sensitivity.
- Adjustable sampling speed, maximum 100 times / sec.
- Maximum display resolution –1 / 16000.

2 ADJUSTABLE DIGITAL FILTER

- Suitable for platform and high speed hopper scale applications

2 THREE SECTION INFORMATION DISPLAY SYSTEM

- 1st section - indication of gross weight or net weight.
- 2nd section - indication of checking gross weight, net weight, tare and batch set values.
- 3rd section – led display indicates the current status of the indicator.

2 FLEXIBLE CALIBRATION PROCEDURES

- 2 point general calibration.
- 5 point linearisation calibration.
- Calibration of zero and span individually and check the current weight value.

2 EIGHT WEIGHING MODES

- The front panel keys or the RS232 / 422 / 485 interface can be used to input data. Memory can be set from the keyboard or through RS232/RS422/RS485 interface.
- The front panel led's can be used to monitor the batch status or it can be read by the control I/O and serial interface (RS232/422/485).
- Loading and unloading batch time can be monitored.
- Auto-free fall (in-flight) compensation function and supplementary flow capability.

2 CONTROL I/O INTERFACE - 8 RELAY OUTPUTS AND 6 OPTO-ISOLATED INPUTS

- Flexible selection of 10 input functions.
- Flexible selection of 14 output functions.
- Output relay connector can be configured to be normally open (a) or normally closed (b).

2 BUILT-IN FULL DUPLEX RS-232C INTERFACE AND CURRENT LOOP (transmit only) OUTPUT INTERFACE

2 OPTIONAL INTERFACE CARDS

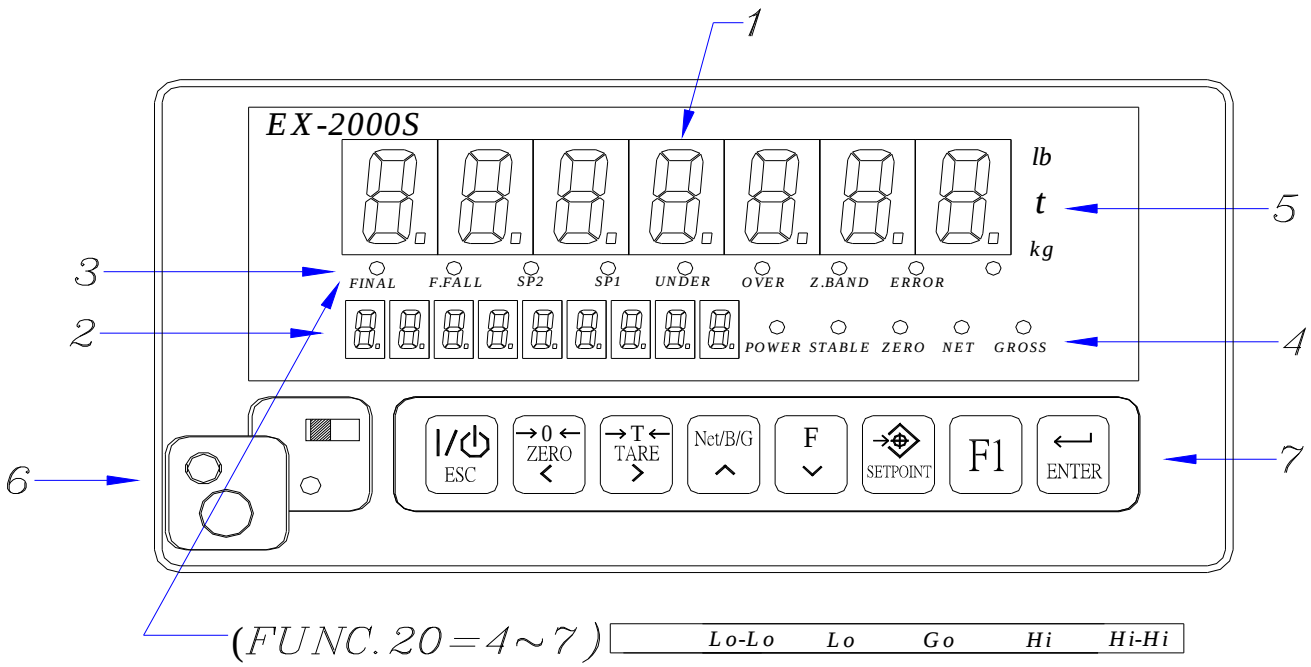
- RS422 / 485 serial input/output interface.
- BCD parallel output interface.
- Analogue output interface.
- Set point input interface.

2 SPLASH-PROOF FRONT PANEL

2 SELF-DIAGNOSTIC FUNCTION, CONVENIENT FOR MAINTENANCE

CHAPTER 2 SPECIFICATIONS

2-1 FRONT PANEL



1 MAIN DISPLAY SECTION

- 7 digits, 20mm high, bright red LED 7 segment display.
- Display can be switched between gross weight and net weight.

2 SUB-DISPLAY SECTION

- 9 digits, 8mm high bright green LED 7 segment display.
- Displays gross weight, net weight, tare value, batch and code settings.

3 UPPER ROW STATUS INDICATION LED's

- ☼ FINAL : The final target weight indication.
  Void when the built-in batch program is activated.
- ☼ F.FALL : Free fall. (Dribble feed)
- ☼ Lo - Lo : Low – Low limit.
- ☼ SP2 : Set-point 2 material feed. (Medium flow)
- ☼ Lo : Low limit section.
- ☼ SP1 : Set-point 1material feed. (Full flow)
- ☼ Go : Preset target weight.
- ☼ UNDER : Under limit.
- ☼ HI : High limit.
- ☼ OVER : Over limit.
- ☼ HI – HI : High – High limit.
- ☼ Z.BAND : Zero band.
- ☼ ERROR : Incorrect control.
- ☼ ☐ : Hold on (Hold mode) / Preset-tare on (Preset-tare mode)

4 LOWER ROW STATUS INDICATION LED's

- ☼ POWER : Power ON/OFF indication.
- ☼ STABLE : Weighing stability indication.
- ☼ ZERO : Indication of correct zero.
- ☼ NET : Lit when the main display is showing net weight.
- ☼ GROSS : Lit when the main display is showing gross weight.

5 WEIGHT UNITS INDICATION

- ♦ **kg, lb or t.**

6 CALIBRATION SWITCH

- ♦ Calibration enabled when the switch is in the ON position (left) and disabled when the switch is in the OFF position (right).

7 KEYS

: * In normal mode, it operates as **Enter** or **Quit**.
* **Entering standby mode** (press and hold): All displays (except the power indication light) will switch off.
* **Exit standby mode**: The indicator will restart.
* In parameter entry mode or in calibration mode, it operates as **Escape**.

: * When entering data, it moves the flashing character one space to the left.
* In normal mode, it operates the **Zero** function. (Under control of function 2 and function 7).

: * When entering data, it moves the flashing character one space to the right.
* In normal mode, it operates the **Tare** function. (Under control of function 7 and function 8).

: * When entering data, it adds “1” to the flashing number or selects the next item.
* In normal mode, it switches the main display between Gross weight and Net weight.

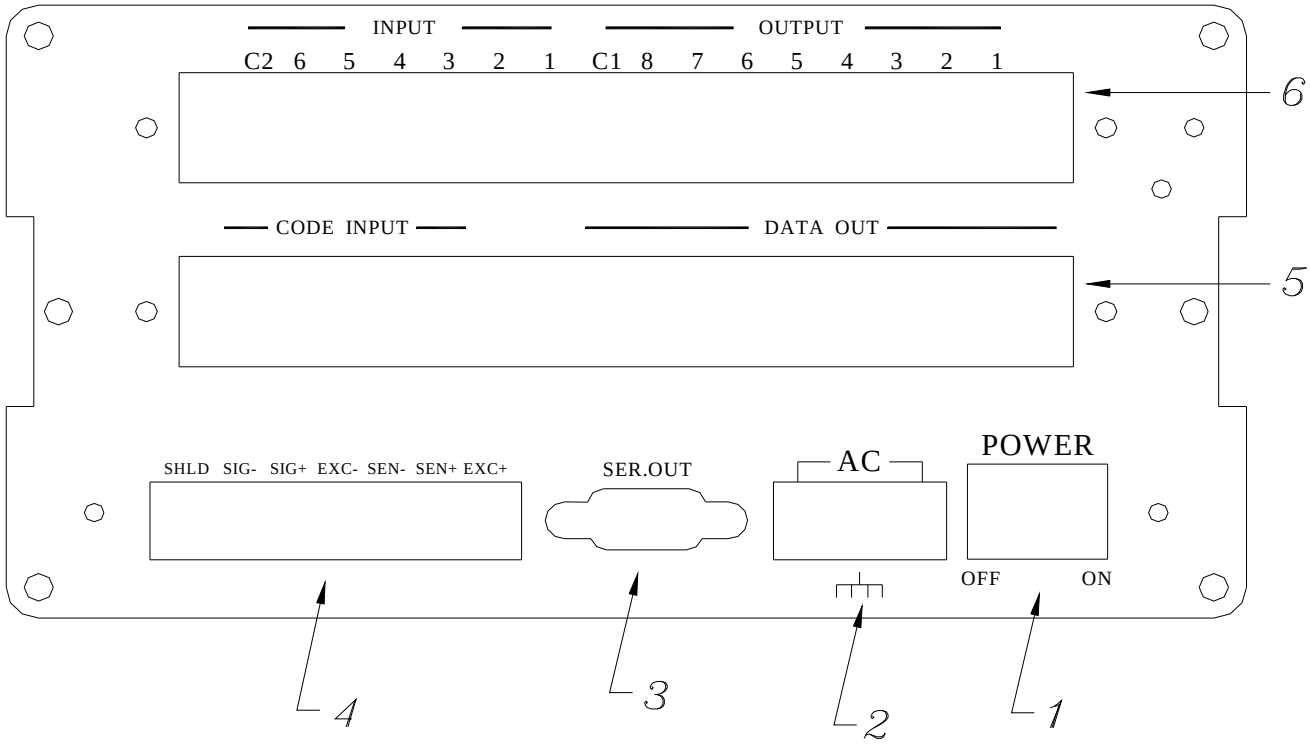
: * When entering data, it subtracts “1” from the flashing number or selects the previous item.
* In normal mode, it is used to set function 13.

: * Used to **set the batch code** or to **set the check value**.

: * Execute the function set by **Func.14**.

: * **Confirmation / enter key**.

2-2 REAR PANEL



1. Power switch (ON/OFF)
2. AC power terminal block.
   (NOTE: The earth connection is located in the centre of this terminal block)
3. RS-232 and current loop serial data output 9 way D-type connector.
4. Load cell connection terminal block.
5. Location of option interface card.
6. Location of external control input and relay output interface terminal blocks.

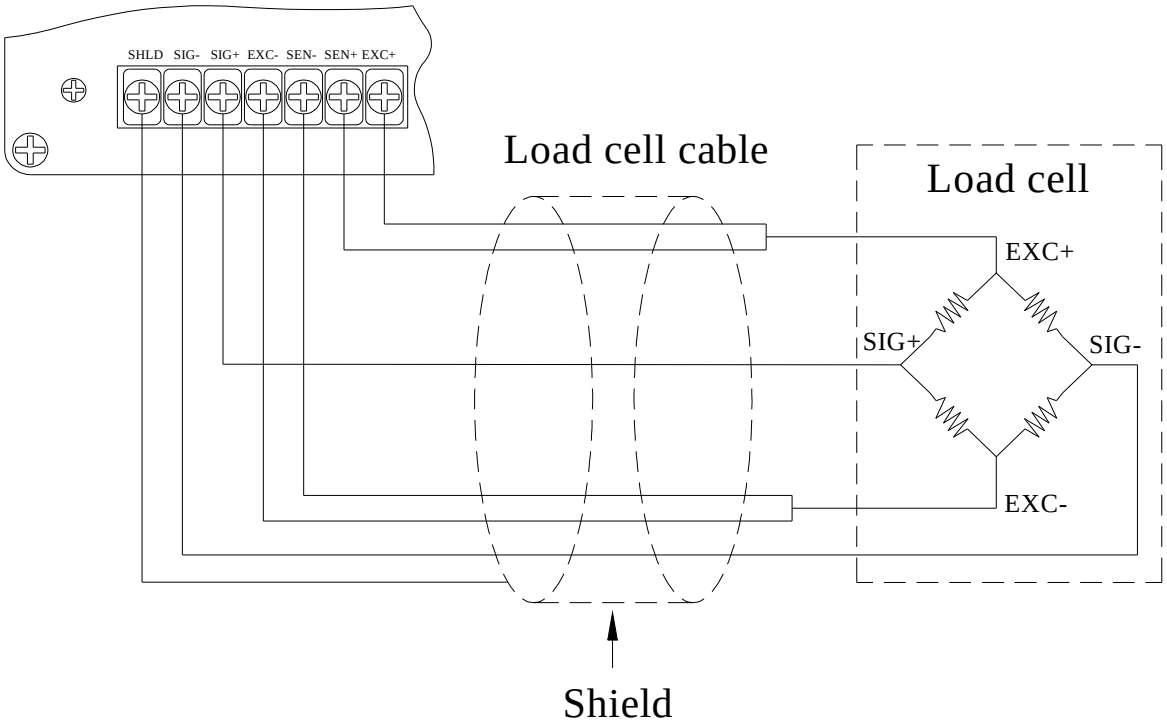
2-3 A/D CONVERSION

- Input sensitivity: ≥ 3μV/d
- Internal resolution: 1 / 1,000,000
- Displayed resolution: 1 / 16,000
- Max sampling speed: 100 / sec.
- Zero range: -1 mV ~ 25 mV
- Signal range: -1 mV ~ 32 mV
- Excitation voltage: 10 Vdc ±5%, 240mA (up to eight 350Ω load cells)
- Zero temperature coefficient: ± (0.2μV + 8ppm × Dead Load) / °C Typical
- Temperature coefficient: ± 8ppm / °C Typical
- Non linearity: 0.01% Full Scale

CHAPTER 3 INSTALLATION

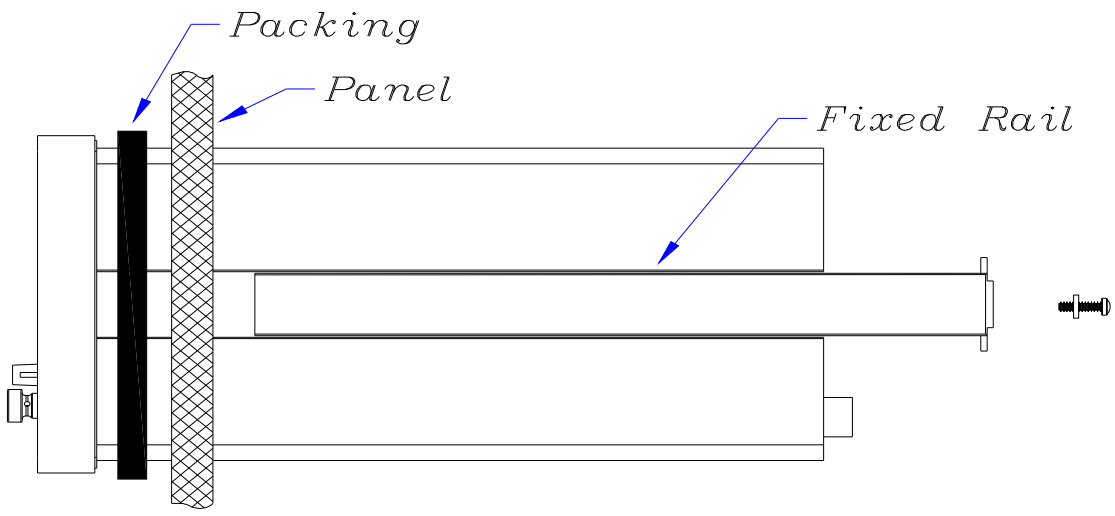
3-1 LOAD CELL

2 It is always advisable to connect SEN+ to EXC+ and SEN- to EXC- when using a 4 wire load cell extension cable, see diagram below. The cable shield (screen) should be connected to earth.

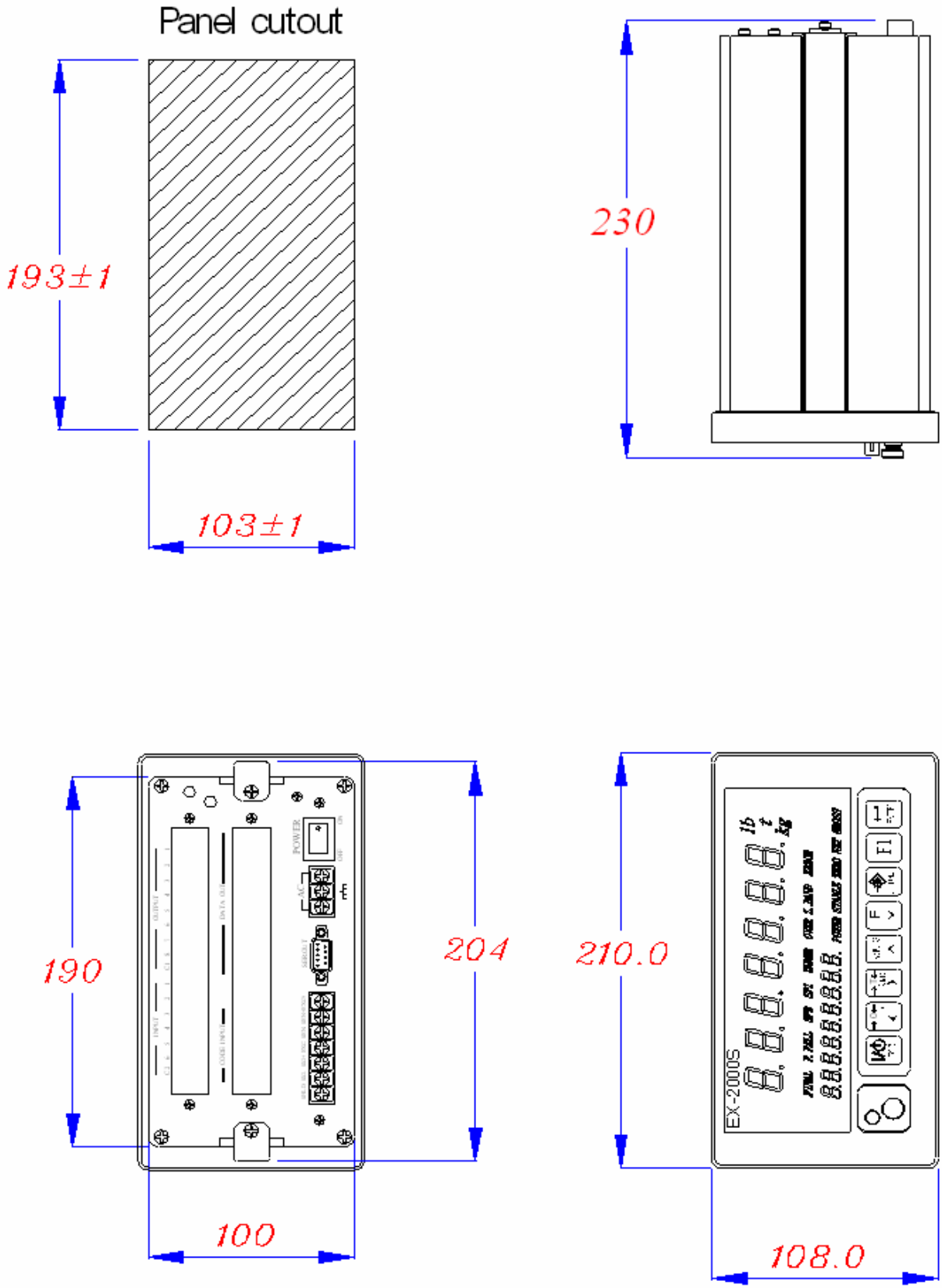


3-2 INDICATOR DIMENSIONS & INSTALLATION

2 The indicator can be fixed in the control panel as indicated below. If the panel is more than 5mm thick then the two side fixing rails may need to be shortened so that the securing screw reaches the rear of the indicator.



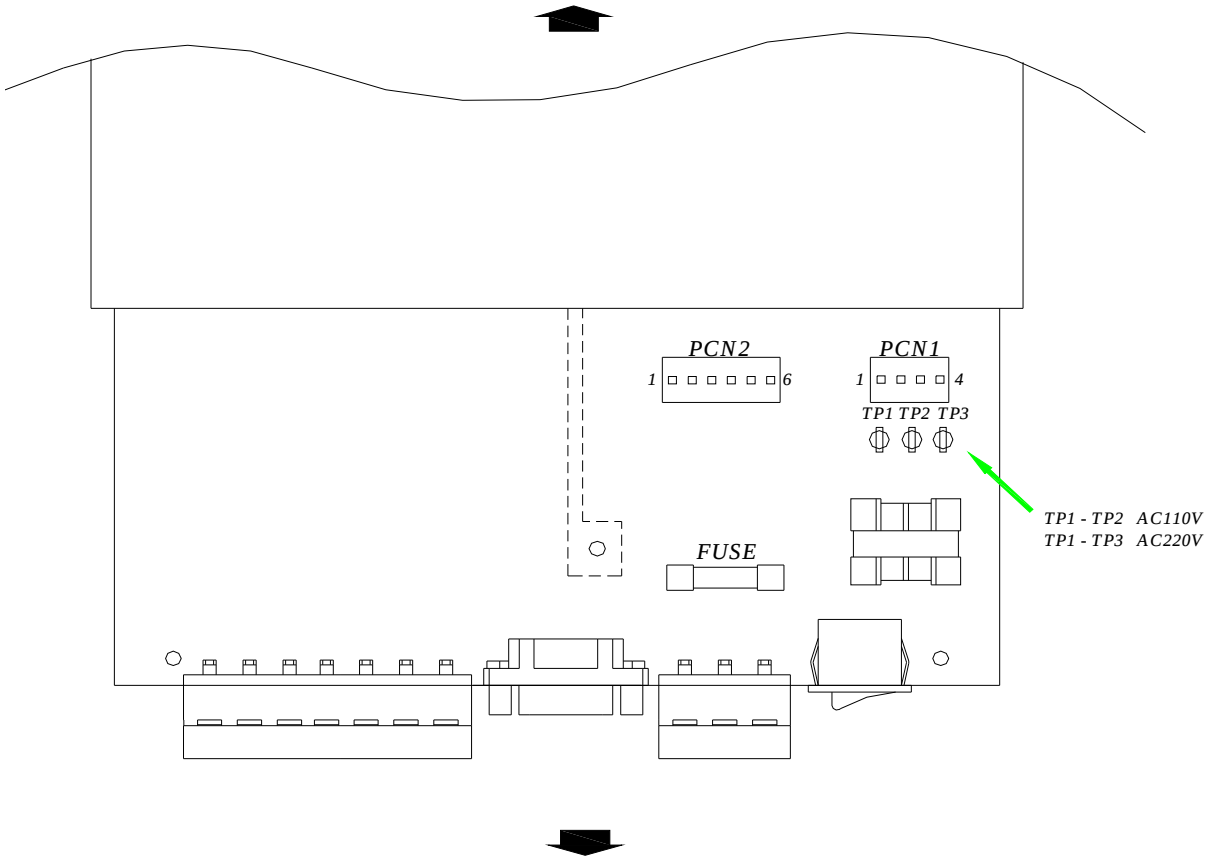
2 INDICATOR DIMENSIONS (UNIT: mm)



3-3 POWER SUPPLY

2 The power on / off switch is located on the rear panel. Connect the ac power cable with the earth core (green / yellow) connected to the centre terminal of the power terminal block located adjacent to the on / off switch. NOTE avoid any exposed un-insulated ring terminals protruding beyond the confines of the terminal block housing and ensure that the clear cover is fitted to the terminal block, to avoid the possibility of electric shock.

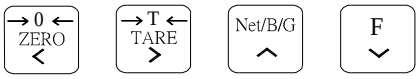
2 To gain access to change the ac voltage (ac110V ⇔ ac220V) or change the internal power fuse switch off and isolate the mains voltage, then unscrew the screws from the rear panel, pull out the main board to do the changes required.



3-4 ACCESSORIES

- Fuse 250V 1A
- Power cable assembly
- Serial output D-type 9 way male connector
- Label (sticker)
- User Instructions

CHAPTER 4 OPERATION



Use these 4 keys to key in the appropriate data when configuring the unit

⇒ Moves current flashing digit one space to the left

⇒ Moves current flashing digit one space to the right

⇒ Adds 1 to the current flashing digit

⇒ Subtracts 1 from the current flashing digit

4-1 FUNCTION CONFIGURATION

(1) Function configuration only can be performed using the front panel keys.

(2) In the normal weighing mode, press and hold the

key, then press the

key to enter to the function configuration mode.

(3) The main display indicates the function number (number flashes). Select and configure the desired function as required.

(4) The sub-display section indicates the current value of the displayed function number.

(5) To change the current value, press the

key to enter to the modification mode.

(6) To exit the modification mode without changing the data, press the

key to quit.

(7) Press the ENTER key after entering the required configuration data, if the function number increments by “1”, it indicates the new data has been accepted. (Successful setting)
If Error is displayed, this indicates that the data is out of range. (Unsuccessful setting)

(8) After the configuration is completed, press the I/⏻ ESC key to exit from the configuration mode and the indicator will reset.

4-2 BATCH / CHECK VALUE SETTING

(1) Use the front panel keys or serial RS-232 / 422 / 485 interface to input the Batch / Check value.

(2) If using the front panel to key in the Batch/Check value, press the SETPOINT key in the normal weighing mode to enter the Batch / Check value mode.

(3) Use →0← ZERO < and →T← TARE > keys to select the desired parameter.
In the batch mode (Func. 20 Set 0 ~ 3), it is possible to set the FINAL, F. FALL, SP2, SP1, UNDER, OVER, Z-BAND parameters.
In the check mode (Func. 20 Set 4 ~ 7), it is possible to set the LO-LO, LO, GO, HI, HI- HI, Z-BAND parameters.

(4) The number on the sub display represents the parameter which is indicated by the flashing LED. To change the data, press the ENTER key to enter the data entry mode, then key-in the new data value and press the ENTER key to save the new data.

(5) Follow method 4 (above), for all of the desired function configuration parameters of the Batch / Check value modes.

(6) Press the I/⏻ ESC key to quit from the data entry mode.

(7) Refer to section 8-2 & 8-3 if using the RS-232 / RS-422 / RS-458 serial interface to input Batch / Check value parameters.

CHAPTER 5 CALIBRATION

5-1 CALIBRATION PROCEDURE

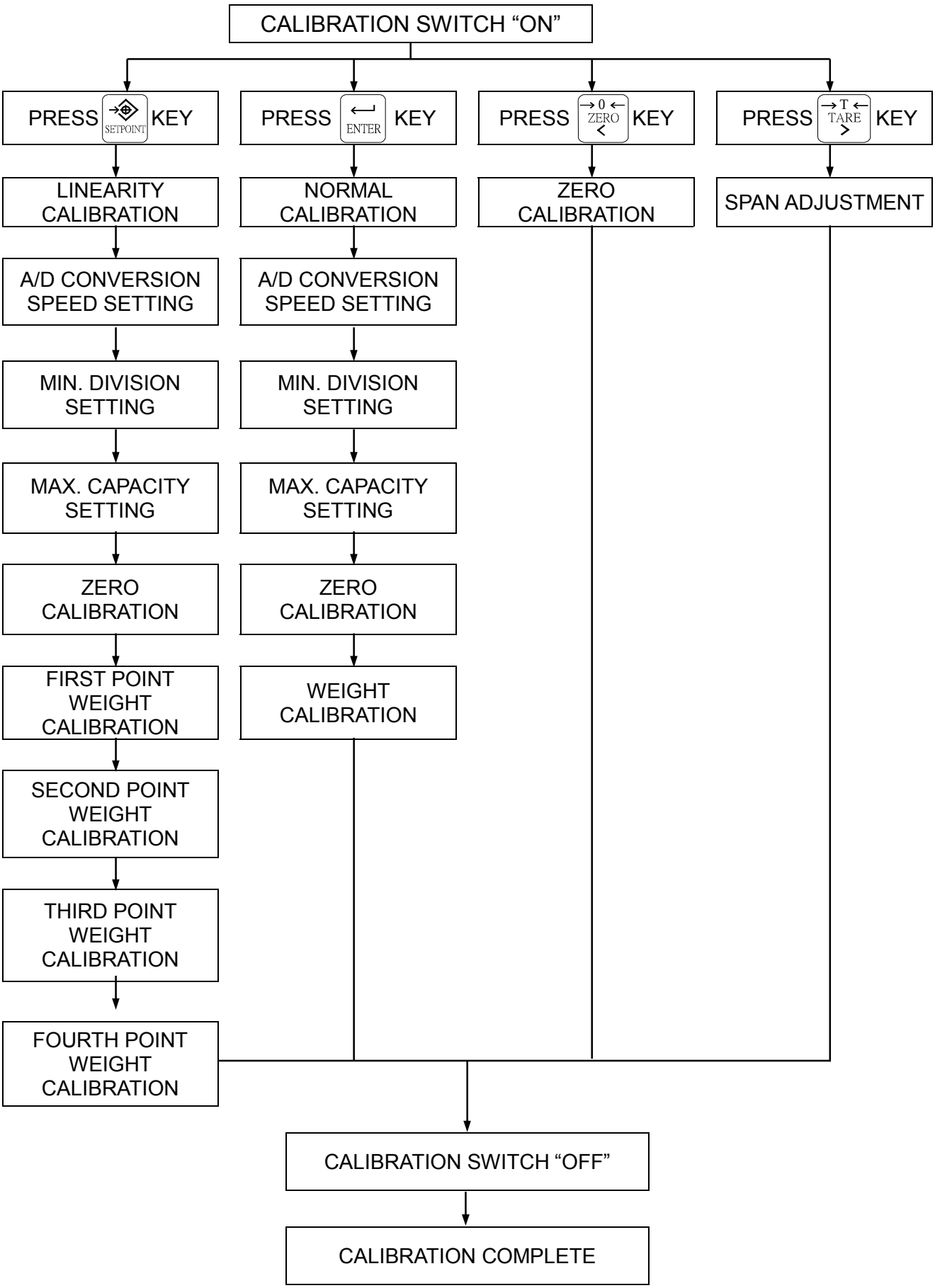
(1) Use the I/⏻ ESC key in any step of the calibration procedure to returned to the previous setting.

(2) If the calibration switch is turned off before the calibration is completed, all parameters set during the procedure will not be saved.

(3) The indicator must have completed normal calibration in order to proceed with zero calibration or individual weight adjustment at zero or span.

(4) It is not be possible to enter zero calibration or span adjustment during linearity calibration.

(5) Calibration procedure:


CALIBRATION SWITCH "ON"
PRESS SETPOINT KEY
PRESS ENTER KEY
PRESS →0← ZERO < KEY
PRESS →T← TARE > KEY
LINEARITY CALIBRATION
NORMAL CALIBRATION
ZERO CALIBRATION
SPAN ADJUSTMENT
A/D CONVERSION SPEED SETTING
A/D CONVERSION SPEED SETTING
MIN. DIVISION SETTING
MIN. DIVISION SETTING
MAX. CAPACITY SETTING
MAX. CAPACITY SETTING
ZERO CALIBRATION
ZERO CALIBRATION
FIRST POINT WEIGHT CALIBRATION
WEIGHT CALIBRATION
SECOND POINT WEIGHT CALIBRATION
THIRD POINT WEIGHT CALIBRATION
FOURTH POINT WEIGHT CALIBRATION
CALIBRATION SWITCH "OFF"
CALIBRATION COMPLETE

5-2 NORMAL CALIBRATION

(1) Press the [ENTER] key to enter to the normal calibration mode.

(2) Set A/D conversion speed when the sub-display section displays

AdS **XXX**, use [Net/B/G ^] and [F v] keys to select 10~100 times/sec. (in multiples of 10), press the [ENTER] key to save the setting.

(3) Set the minor display division size when the sub-display section displays

d **XX**, use [Net/B/G ^] and [F v] keys to select the appropriate division size (1, 2, 5, 10, 20 or 50), press the [ENTER] key to save the setting.

(4) Set the Capacity when the sub-display section displays

C **XXXXXX** figures, use [→0← ZERO <] [→T← TARE >] [Net/B/G ^] [F v] keys to select the capacity required. Press the [ENTER] key to save the setting.

If Error 0 **X** is displayed, see section 5-6 for reference.

(5) Calibrate zero when the sub-display section displays

0 2Er 0. Make sure there is no weight on the platform or in the hopper, press the [ENTER] key and the sub-display section displays 0 ------ and after approximately 10 seconds the zero calibration is complete.

If Error 0 **X** is displayed, see section 5-6 for reference.

(6) Calibrate the weight span when the sub-display section displays

S **XXXXXX**. Put a known weight on the platform or in the hopper and use the front panel to key in the weight value. Wait until the system has stabilized, press the [ENTER] key and the sub-display section will display 0 ------

the process is completed after approximately10 seconds.

If Error 0 **X** is displayed, see section 5-6 for reference.

(7) Switch off the calibration switch when the main display section displays

CAL . - the normal calibration procedure is completed.

5-3 LINEARITY CALIBRATION

(1) With the main display showing CAL . Press the SETPOINT key to enter to the linearity calibration mode.

(2) To set the A/D conversion rate, division size, maximum capacity and calibrate zero (see 5-2, sections 2, 3, 4, and 5)

(3) After calibrating zero, calibrate the 1st lineariser point when the sub-display section displays P1 **XXXXXX**, put the first lineariser weight on the platform or in the hopper and use the front panel keys to enter the weight value. Wait until the system has stabilized.

Press the ENTER key and the sub-display section will display - - - - - - the point calibration is completed after approximately 10 seconds.

If Error **X** is displayed, refer to section 5-6 for reference.

(4) Calibrate the 2nd lineariser point when the sub-display section displays P2 **XXXXXX,** put the second lineariser weight on the platform or in the hopper (together with the previous weight) and use the front panel keys to enter the total weight value.

Wait until the system has stabilized; press the ENTER key, the sub-display section will display - - - - - - the point calibration is completed after approximately 10 seconds.

If Error **X** is displayed, refer to section 5-6 for reference.

(5) Use the procedure above to set the third and the forth lineariser points.

(6) After all four linearity points have been calibrated the main display will show CAL . Turn the calibration switch off and the linearity calibration is completed.

5-4 ZERO CALIBRATION

(1) With the main display showing CAL . Press the →0← ZERO < key to enter zero calibration mode.

(2) The sub-display section displays 0 2Ero.

(Press the SETPOINT key to check the current weight value, it is displayed on the sub-display),

remove all weight from the platform or the hopper.

Wait until the system has stabilized and press the ENTER key,

the sub-display section should display 0 - - - - - -

and the process is completed after in approximately 10 seconds.

(3) When the main display shows CAL . Turn off the calibration switch and the zero calibration procedure is completed.

5-5 SPAN ADJUSTMENT

(1) With the main display showing CAL . Press the →T← TARE > key to enter the span adjustment mode.

(2) When the sub-display section displays S **XXXXXX**,

place a accurate known weight object on the platform or in the hopper (press the SETPOINT key to check the current weight value and press the SETPOINT key again to return to the setting mode), key in the weight value of the applied load and wait until the system has stabilized then press the ENTER key, the sub-display will display 0 - - - - - - and the span calibration is completed after approximately 10 seconds.

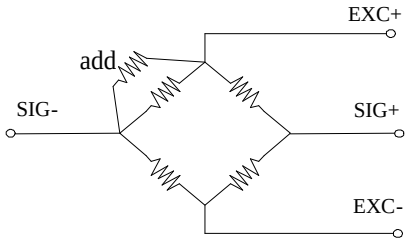
(3) When the main display shows CAL. Turn off the calibration and the span calibration is completed.

5-6 INDICATION OF CALIBRATION ERROR

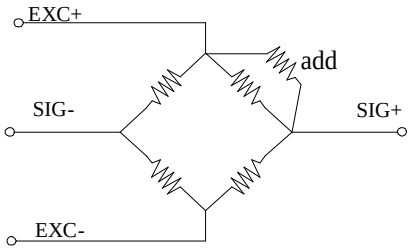
(1) Error 0 Unusual load cell or A/D conversion circuit.

(2) Error 1 (Max. capacity / Min. division) > 16000 or can not be divided integrally.

(3) Error 2 When calibrating zero, the load cell output signal is > the maximum adjustable range of 25 mV. If the load cell is not damaged and has been correctly installed, then connect a low temperature coefficient resistor (50kΩ ~ 500kΩ) to adjust load cell's output voltage. See diagram below for reference.



(4) Error 3 When calibrating zero, the load cell output signal is < the minimum adjustable range of 25 mV If the load cell is not damaged and has been installed correctly, then connect a low temperature coefficient resister (50kΩ ~ 500kΩ) to adjust load cell's output voltage. See diagram below for reference.



(5) Error 4 Span calibration value > maximum capacity.

(6) Error 5 The linearity weight value ≤ the previous lineariser value.

(7) Error 6 The internal resolution is > 0.3μV/d.

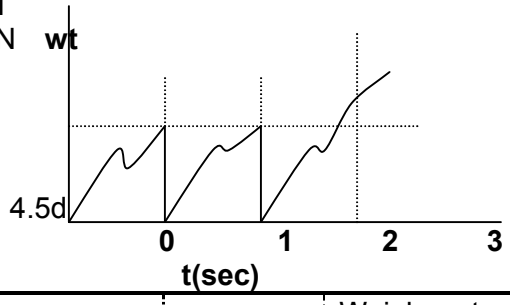
(8) Error 7 Actual scanned weight value ≤ zero point or previous calibration point.

(9) Error 8 Load cell output voltage is > indicator's input range of 32mV.

CHAPTER 6 BASIC FUNCTION SETUP

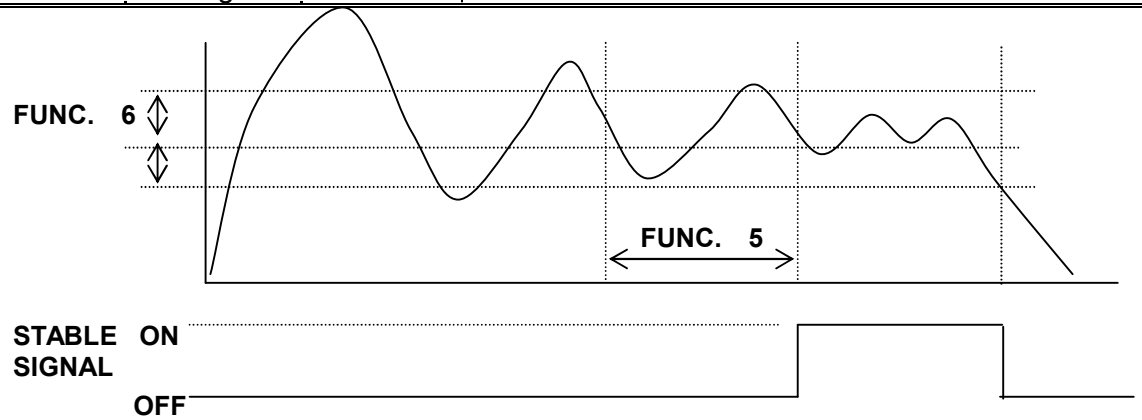
ITEM	FUNCTION	SET VALUE PARAMETER	SET VALUE DESCRIPTION	FACTORY STANDARD SET VALUE
FUNC. 0	Weight unit	0	None	1
		1	kg	
		2	t	
		3	lb	
FUNC. 1	Decimal	0	None	0
		1	0.0	
		2	0.00	
		3	0.000	
		4	0.0000	
FUNC. 2	Zero range	0 ~ 30 (±%)	Zero range = Zero calibration ± (Max. capacity × set value %)	2
FUNC. 3	Zero tracking	0.0 ~ 5.0 (sec)	Zero tracking time starts when the weight enters the zero range. When set to 0.0, the zero tracking function is disabled.	1.0
FUNC. 4	Zero tracking width	0 ~ 9	Tracking width=(set value×½)d, d=Min division. The zero tracking width is the range of weight over which the zero tracking will operate. When set to 0, the zero tracking function is disabled.	2

EXAMPLE : FUNC. 3 = 1.0 FUNC. 4 = 9



When the weight is in zero range as defined in (Func. 2), every time the zero tracking timer expires (Func. 3), if the weight is within the zero tracking width (Func. 4) but not at zero, the indicator will set the weight back to the zero point.

FUNC. 5	Weigher steady time	0.0 ~ 5.0 (sec)	Weigher steady time. The weight must be within the weigher steady range for this time before the steady signal is given. When set to 0.0, the weigher steady is disabled.	1.0
FUNC. 6	Weigher steady range	0 ~ 9	Weigher steady range in divisions. When set 0, the weigher steady is disabled.	2



ITEM	FUNCTION	SET VALUE				FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION			
FUNC. 7	Tare and Zero when the weight is unstable	0	OFF			1
		1	ON			
FUNC. 8	Tare at negative gross	0	OFF			1
		1	ON			
FUNC. 9	Digital filter	0 ~ 49	Greater the value the greater the filtering. When set to 0, the digital filter function is off.			25
FUNC.10	Inhibit front panel keys	00000000 ↓ 11111111	0	OFF	The order of the bits and front panel key positions are related to each other	00000000
			1	ON		
FUNC.11	Display update rate	0	20 Times/sec.			0
		1	10 Times/sec.			
		2	5 Times/sec.			
FUNC.12	Contents of Sub-display section	0	None			0
		1	Gross			
		2	Net			
		3	Tare			
		4	Batch codes and Final value			
		5	Totalised weight			
		6	Number of transactions in the total			
		7	Totalised weight / Number of transactions in the total			
		8	Quantity / Unit weight			
		9	Preset-tare weight			

ITEM	FUNCTION	SET VALUE		FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION	
FUNC.13	"F" key function	**Parameter Þ Description** 0 ⇒ None 1 ⇒ Manually output the parallel and serial data 2 ⇒ Clear Tare 3 ⇒ Start Batch 4 ⇒ Stop Batch 5 ⇒ Add current Net weight to the totaliser and increment transactions counter 6 ⇒ Delete previous totalised weight and subtract one from the transaction counter 7 ⇒ Toggle between display of the totalised weight or the transaction counter 8 ⇒ Clear totalised weight and transaction counter to zero 9 ⇒ Hold ON/OFF 10⇒ Switch the display of Unit Weight and Quantity 11⇒ Unit Weight Input or Quantity Sampling 12⇒ Preset-tare input 13⇒ Preset-tare ON/OFF		0
FUNC.14	"F1" key function			
FUNC.15	Hold	0	No hold	0
		1	Peak hold (a positive value)	
		2	Peak hold (absolute value)	
FUNC.16	Preset-tare	0	Preset-tare gross weight	0
		1	Preset-tare percentage	

CHAPTER 7 BATCH AND CODE SELECT MODE

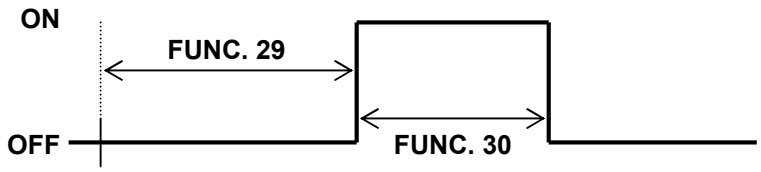
7-1 FUNCTION SETTING

ITEM	FUNCTION	SET VALUE		FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION	
FUNC.19	Batch Comparison	0	Weight Comparison	0
		1	Quantity Comparison	
FUNC.20	Weighing mode	0	Normal batch	0
		1	Loss-in-weight	
		2	Normal batch (Built-in program)	
		3	Loss-in-weight (Built-in program)	
		4	Check weighing 1	
		5	Check weighing 2	
		6	Check weighing 3	
		7	Check weighing 4	
FUNC.21	Batch start delay time	0.0 ~ 25.5 (sec)	The built-in auto-program normally starts the batch comparison procedure after the input of the batch start signal (leading edge). If FUNC.21 is > 0 then the batch is started after the timer expires (effectively trailing edge)	0.0
FUNC.22	Batch time Monitoring	0 ~ 255 (sec)	The batch time monitoring starts after batch weighing is started. The batch time output signal is switched off when the timer has expired. This count down timer can be used to monitor the speed of the batching process to highlight problems with material feed and other process variables etc.	0
FUNC.23	SP1 Trip comparison delay time	0.0 ~ 25.5 (sec)	The full flow trip point is not checked during the period this timer is active. Used to effectively de-bounce the comparison between the live weight and the trip point. If set to zero the de-bounce function is inhibited.	0.0
FUNC.24	SP2 Trip comparison delay time	0.0 ~ 25.5 (sec)	The medium flow trip point is not checked during the period this timer is active. Used to effectively de-bounce the comparison between the live weight and the trip point. If set to zero the de-bounce function is inhibited.	0.0

ITEM	FUNCTION	SET VALUE		FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION	
FUNC.25	F.FALL Trip comparison delay time	0.0 ~ 25.5 (sec)	The dribble flow trip point is not checked during the period this timer is active. Used to effectively de-bounce the comparison between the live weight and the trip point. If set to zero the de-bounce function is inhibited.	0.0
FUNC.26	Auto in-flight compensation	0	OFF	0
		1	ON	
FUNC.27	Auto in-flight compensation active window weight (Enabled by setting Func.26 to ON)	0 ~999999kg	If the final settled weight is outside of the target weight ± this active window value, then this settled weight is ignored for the purposes of in-flight compensation. This caters for unusual circumstances such as external weight interference or random errors in product feed (lumpy / sticky).	0
FUNC.28	Batch finish signal	0	Do not wait until the weight has stabilized	1
		1	Wait until the weight has stabilized.	
FUNC.29	Batch finish output signal delay time	0.0 ~ 25.5 (sec)	Output the batch finish signal after the delay time.	0.5

ITEM	FUNCTION	SET VALUE		FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION	
FUNC.30	Batch finish output signal time	0.0 ~ 25.5 (sec)	Batch finish output signal on time. If set to 0, the output signal will remain off until the next batch is started.	**0.5**

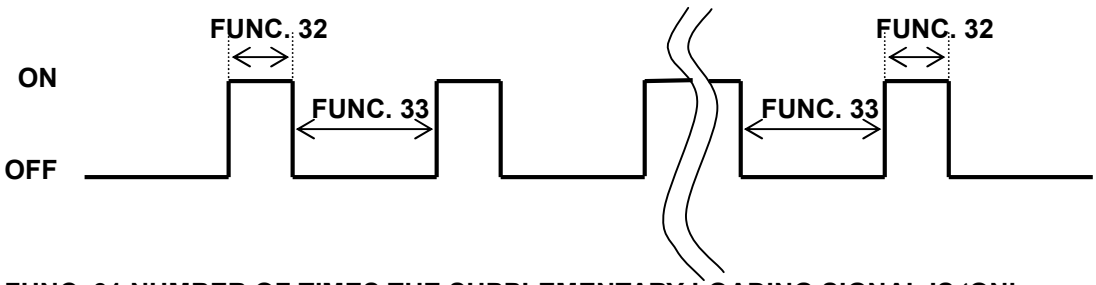
BATCH FINISH SIGNAL



BATCH FINISH

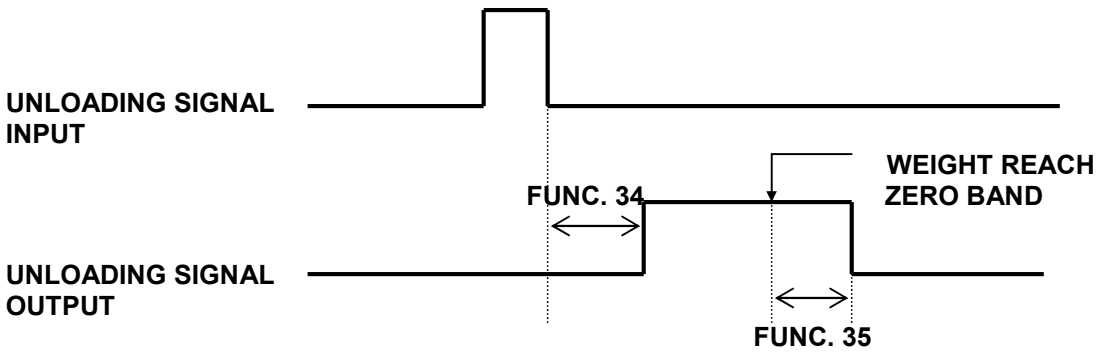
FUNC.31	Number of supplementary loading cycles	0 ~ 255	If the set to 0, this function is disabled.	**0**
FUNC.32	Supplementary loading gate open time	0.01 ~ 2.55 (Sec)	The time the supplementary loading signal is switched on for. (Func.31)	**0.1**
FUNC.33	Supplementary loading gate close time	0.1 ~ 25.5 (Sec)	The time the supplementary loading signal is switched off for. (Func.31)	**1.0**

SUPPLEMENTARY LOADING SIGNAL



FUNC. 31 NUMBER OF TIMES THE SUPPLEMENTARY LOADING SIGNAL IS 'ON'

ITEM	FUNCTION	SET VALUE		FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION	
FUNC.34	Unloading start delay time	0.0 ~ 25.5 (Sec)	Delay before the Unloading signal is switched ON	0.0
FUNC.35	Unloading stop delay time	0.0 ~ 25.5 (Sec)	Delay before the Unloading signal is switched OFF	0.0
FUNC.36	Max. unloading time	0 ~ 255 (Sec)	Will not activate the internal unloading control function, If set to 0.	0
FUNC.37	Under and Over	0	Compare at any weighing moment	0
		1	Compare after final batch	
FUNC.38	Include the zero band into the final Batch value (unloading only)	0	Not included	0
		1	Included	
FUNC.39	Auto-totalisation of weighings and weight	0	OFF	0
		1	ON	



Note :

1. **FUNC. 21 ~ FUNC. 37 used with the built-in program for loading and unloading batching. FUNC. 20 set in modes 2 & 3.**
2. **FUNC. 38 can only be used with the built-in program for unloading batching. FUNC. 20 set in mode 3.**

7-2 EXTERNAL INPUT SIGNAL SETTING

ITEM	FUNCTION	SET VALUE PARAMETER - DESCRIPTION	FACTORY STANDARD SET VALUE
FUNC.41	Input 1	0 = Not in use 1 = Zero 2 = Tare 3 = Clear Tare 4 = Batch Start 5 = Batch Stop 6 = Unloading Start 7 = Print serial and parallel output information manually 8 = Totalising command Totalise current net weight and increments the number of weighings 9 = Cancel Total Delete previous totalised weight and subtracts one from the number of weighings 10 = Clear Total Clear totalisers back to zero 11 = Hold 12 = Preset-tare	1
FUNC.42	Input 2		2
FUNC.43	Input 3		3
FUNC.44	Input 4		4
FUNC.45	Input 5		5
FUNC.46	Input 6		6

7-3 RELAY OUTPUT SIGNAL SETTING

ITEM	FUNCTION	SET VALUE				FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION			
FUNC.50	Output Connection mode	00000000 ↓ 11111111	0	Normally Open (connection A)	The bits and output point position are related to each other	00000000
			1	Normally Closed (connection B)		
FUNC.51	Output 1	**PARAMETER Þ DESCRIPTION** 0 ⇒ Not in use 1 ⇒ Zero Band 2 ⇒ Under / Hi - Hi 3 ⇒ Over / Hi 4 ⇒ SP1 / Go 5 ⇒ SP2 / Lo 6 ⇒ Free Fall / Lo - Lo 7 ⇒ Unloading 8 ⇒ Batch Finish 9 ⇒ Stable 10 ⇒ Running (built-in program in weighing process) 11 ⇒ Error (built-in program incorrect weighing) 12 ⇒ External Input signal acknowledge 13 ⇒ Weighing Capacity Overflow 14 ⇒ Battery Low				1
FUNC.52	Output 2					2
FUNC.53	Output 3					3
FUNC.54	Output 4					4
FUNC.55	Output 5					5
FUNC.56	Output 6					6
FUNC.57	Output 7					7
FUNC.58	Output 8					8

7-4 WEIGHING MODE OPERATION

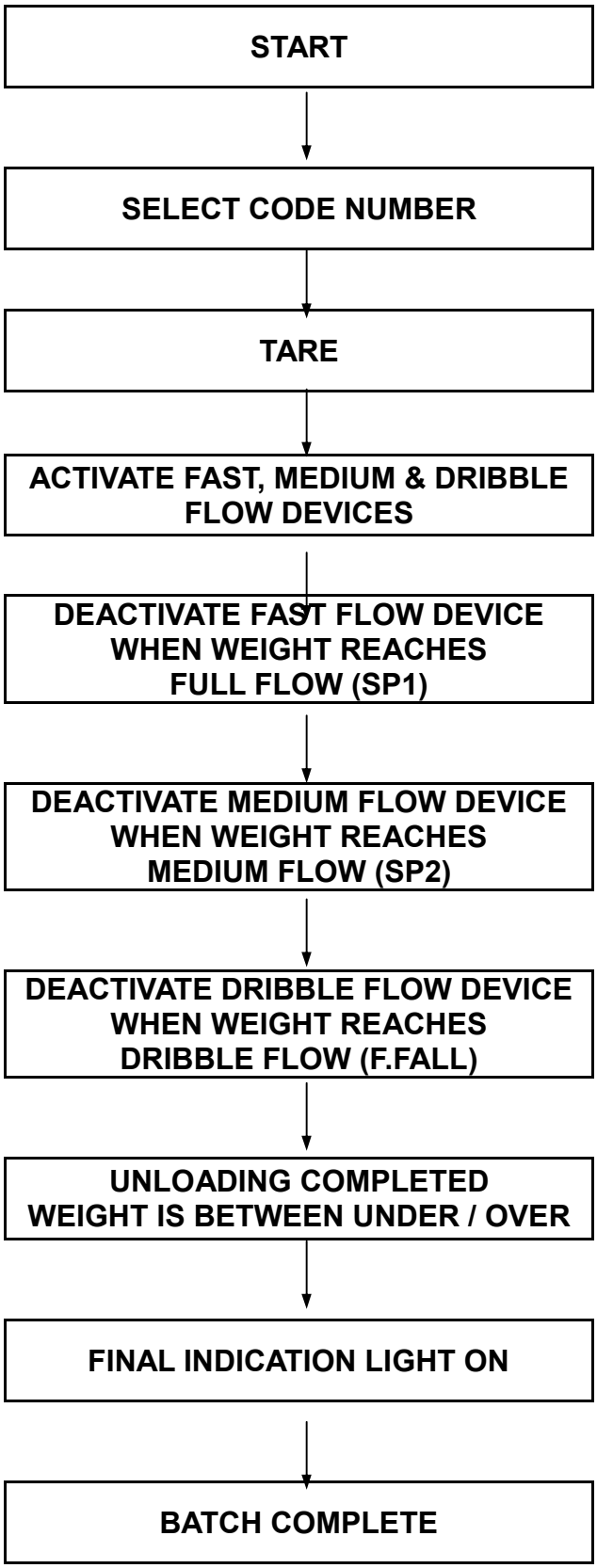
7-4-1 NORMAL LOADING BATCH (FUNC. 20 = 0)

OUTPUT SIGNAL CONDITION :

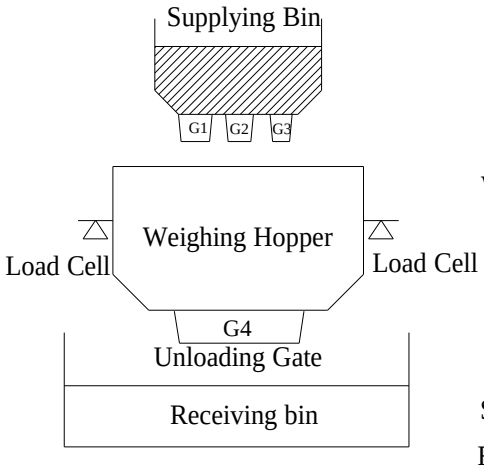
SIGNAL	OUTPUT CONDITION	ON / OFF STATUS		
		RELAY OUTPUT		FRONT PANEL LED INDICATION LIGHT
		FUNC. 50 = 00000000	FUNC. 50 = 11111111	
FINAL	UNDER ≤ NET ≤ OVER	X	X	ON
F.FALL (dribble)	NET ≥ Final – F.FALL	ON	OFF	ON
SP2 (medium)	NET ≥ Final – SP2	ON	OFF	ON
SP1 (full)	NET ≥ Final – SP1	ON	OFF	ON
UNDER	NET < Final - UNDER	ON	OFF	ON
OVER	NET > Final + OVER	ON	OFF	ON
Zero Band	Gross ≤ Zero Band	ON	OFF	ON

4 Func.50 is used to select the relay signal output logic.
Each selection of the output signals can be modified by using Func.51~58.

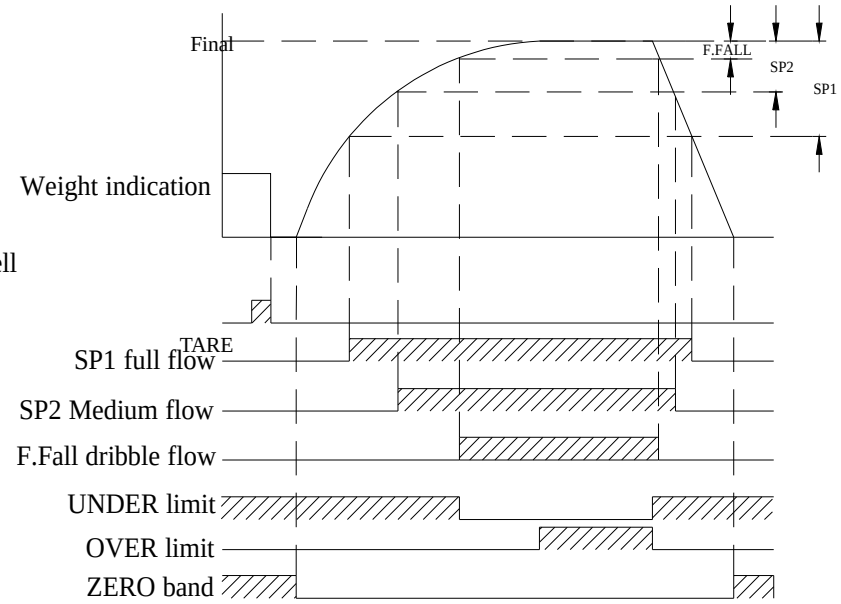
BATCH PROCEDURE FLOW CHART:



FUNCTIONAL DESCRIPTION:



G1: Full flow gate (SP1)
G2: Medium flow gate (SP2)
G3: Dribble flow gate (F.FALL)



1. Select supply bin (memory code).
2. Tare.
3. G1, G2 & G3 gates fully open.
4. G1 gate closes when full flow weight is reached (SP1).
5. G2 gate closes when medium flow weight is reached (SP2).
6. G3 gate closes when free flow weight is reached (F.FALL).
7. Use the under/over output signal or front panel indication light (final) to check if the weight value is between under and over.
8. After loading is completed, start the unloading process. Use the zero band range signal to monitor if the unloading process is finished.
   The next batch can be started after unloading is completed.

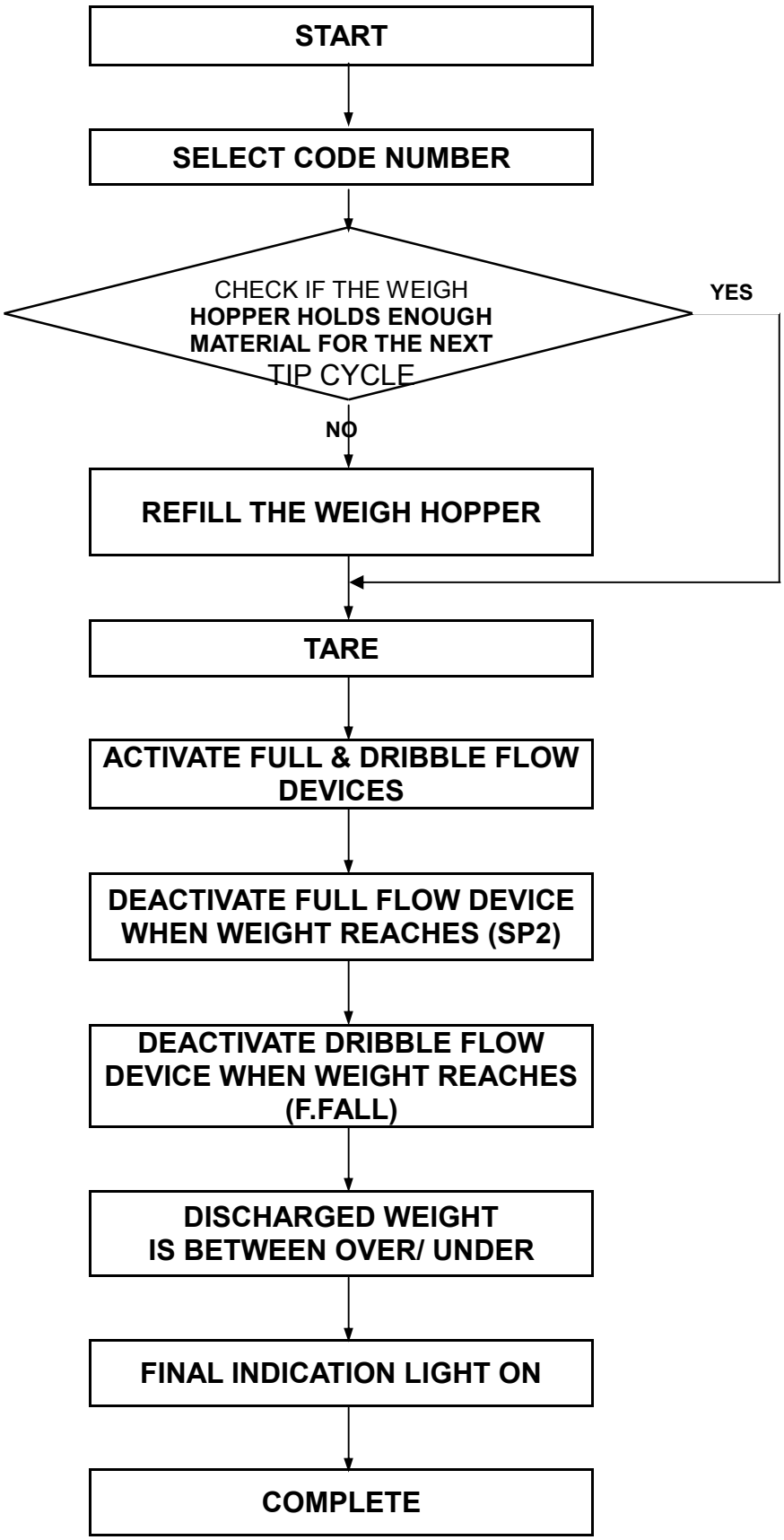
7-4-2 NORMAL DISCHARGING BATCH (FUNC. 20 = 1)

OUTPUT SIGNAL CONDITION:

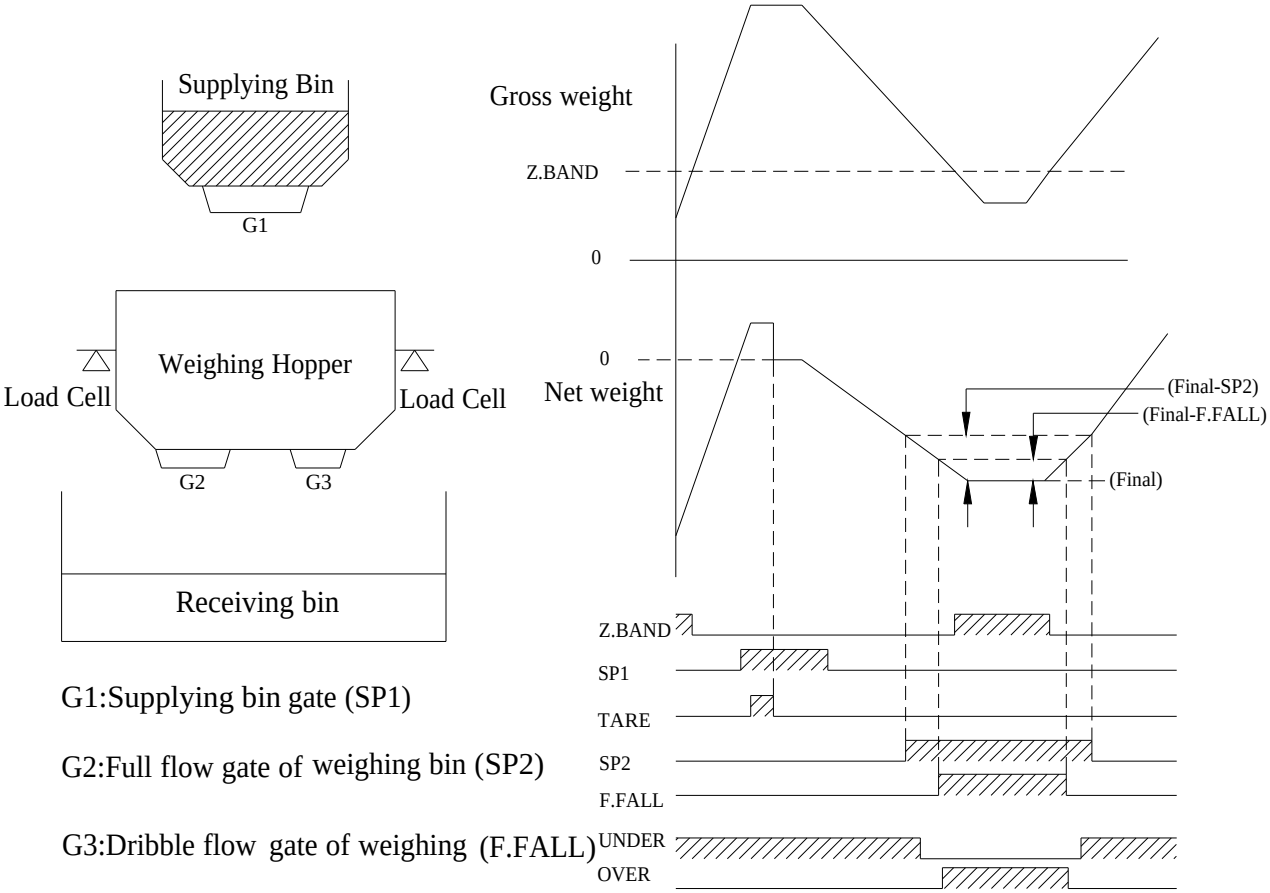
SIGNAL	OUTPUT CONDITION	ON / OFF STATUS		
		RELAY OUTPUT		FRONT PANEL LED INDICATION LIGHT
		FUNC. 50 = 00000000	FUNC. 50 = 11111111	
FINAL	UNDER ≤ -NET ≤ OVER	X	X	ON
F.FALL (dribble)	-NET ≥ Final – F.FALL	ON	OFF	ON
SP2 (full)	-NET ≥ Final – SP2	ON	OFF	ON
SP1 (supply)	Gross ≥ SP1	ON	OFF	ON
UNDER	-NET < Final - UNDER	ON	OFF	ON
OVER	-NET > Final + OVER	ON	OFF	ON
Zero Band	Gross ≤ Zero Band	ON	OFF	ON

4 Func.50 is used to select the relay signal output logic.
Each selection of the output signals can be modified by using Func.51~58.

DISCHARGING BATCH PROCEDURE FLOW CHART:



FUNCTIONAL DESCRIPTION:



G1:Supplying bin gate (SP1)

G2:Full flow gate of weighing bin (SP2)

G3:Dribble flow gate of weighing (F.FALL)

1. Check the weigh hopper still has enough material for the next tip cycle, if not, the weigh hopper is refilled by opening gate G1. G1 is closed after the weight reaches SP1 full load weight.
2. Tare.
3. Open gates G2 and G3.
4. G2 gate closed when discharged weight reaches SP2 full flow.
5. G3 gate closed when discharged weight reaches F.FALL dribble flow.
6. Use over limit / under limit output signal or front panel FINAL indication light to check whether the weight value is between over limit / under limit.
7. Repeat step 1~6 for the next discharge tip cycle.

7-4-3 BUILT-IN CHARGING BATCH PROCEDURE (FUNC. 20 = 2)

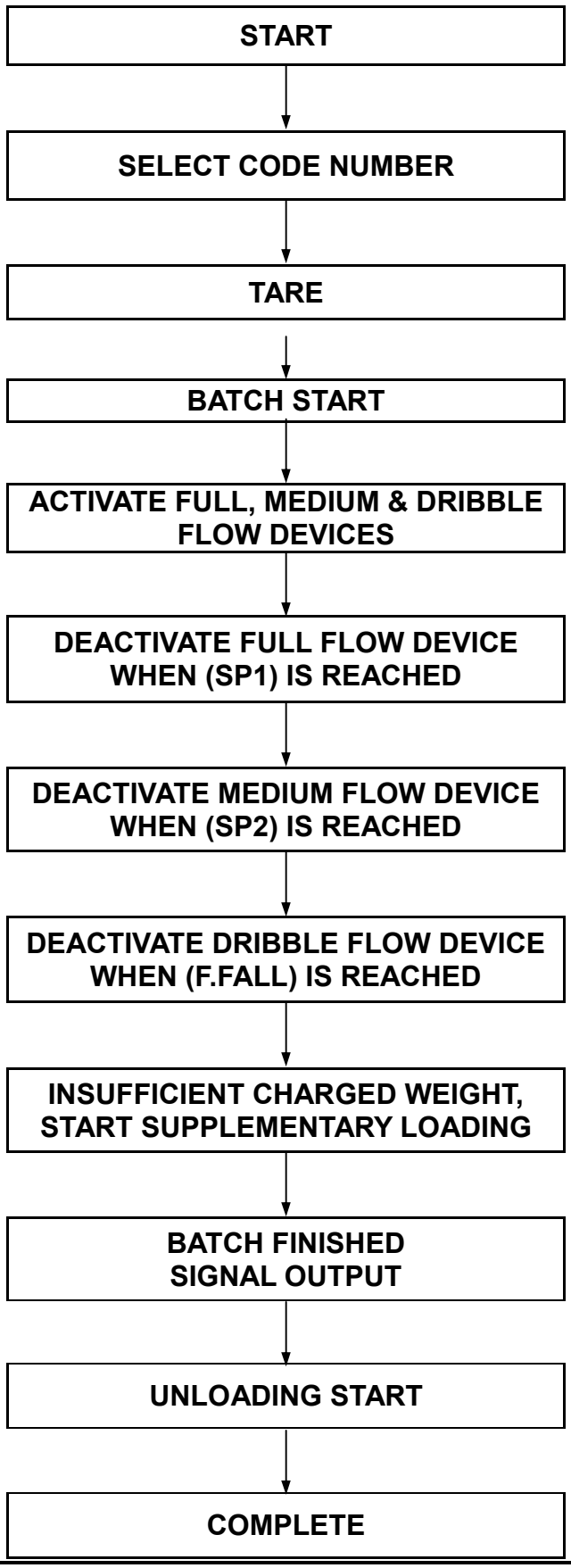
OUTPUT SIGNAL CONDITION:

SIGNAL	OUTPUT CONDITION	ON / OFF STATUS		
		RELAY OUTPUT		FRONT PANEL LED INDICATION LIGHT
		FUNC. 50 = 00000000	FUNC. 50 = 11111111	
F.FALL (dribble)	NET ≥ Final – F.FALL	OFF	ON	OFF
SP2 (medium)	NET ≥ Final – SP2	OFF	ON	OFF
SP1 (full)	NET ≥ Final – SP1	OFF	ON	OFF
UNDER	NET < Final - UNDER	ON	OFF	ON
OVER	NET > Final + OVER	ON	OFF	ON
Zero Band	Gross ≤ Zero Band	ON	OFF	ON

4 The full, medium and dribble flow display LED's and relay outputs are ON after the start input signal has been applied. The outputs and LED's switch OFF when the weight reaches the appropriate trip value.
Under / over / z.band (zero band) display LED's and relay outputs switch ON when their respective conditions are met.

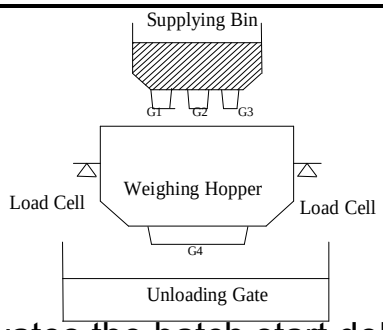
4 Func.50 is used to select the relay signal output logic.
Each selection of the output signals can be modified by using Func.51~58.

BATCH PROCEDURE CHART:



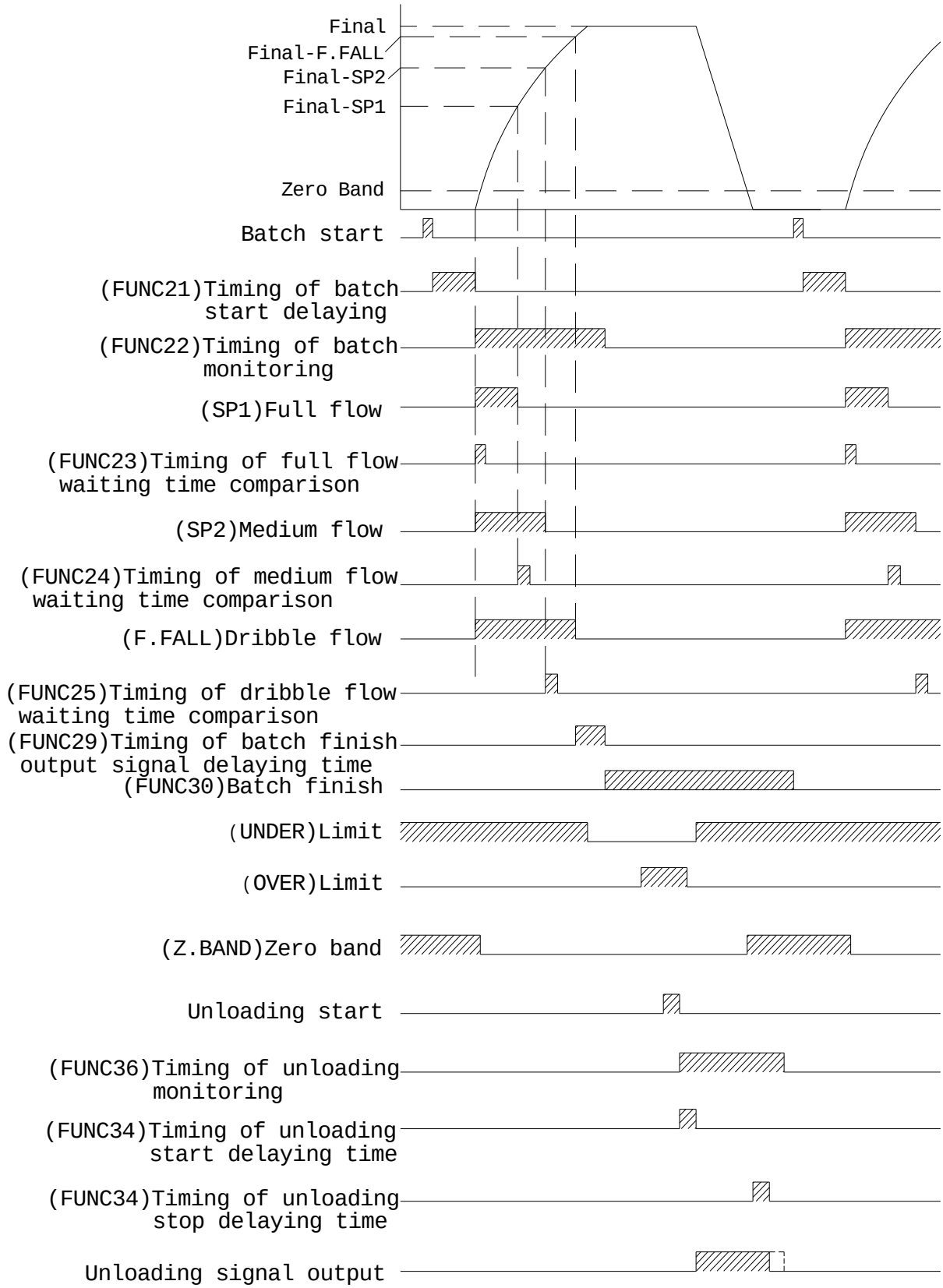
FUNCTIONAL DESCRIPTION:

G1: Full flow gate (SP1)
G2: Medium flow gate (SP2)
G3: Dribble flow gate (F.FALL)
G4: Unloading gate.



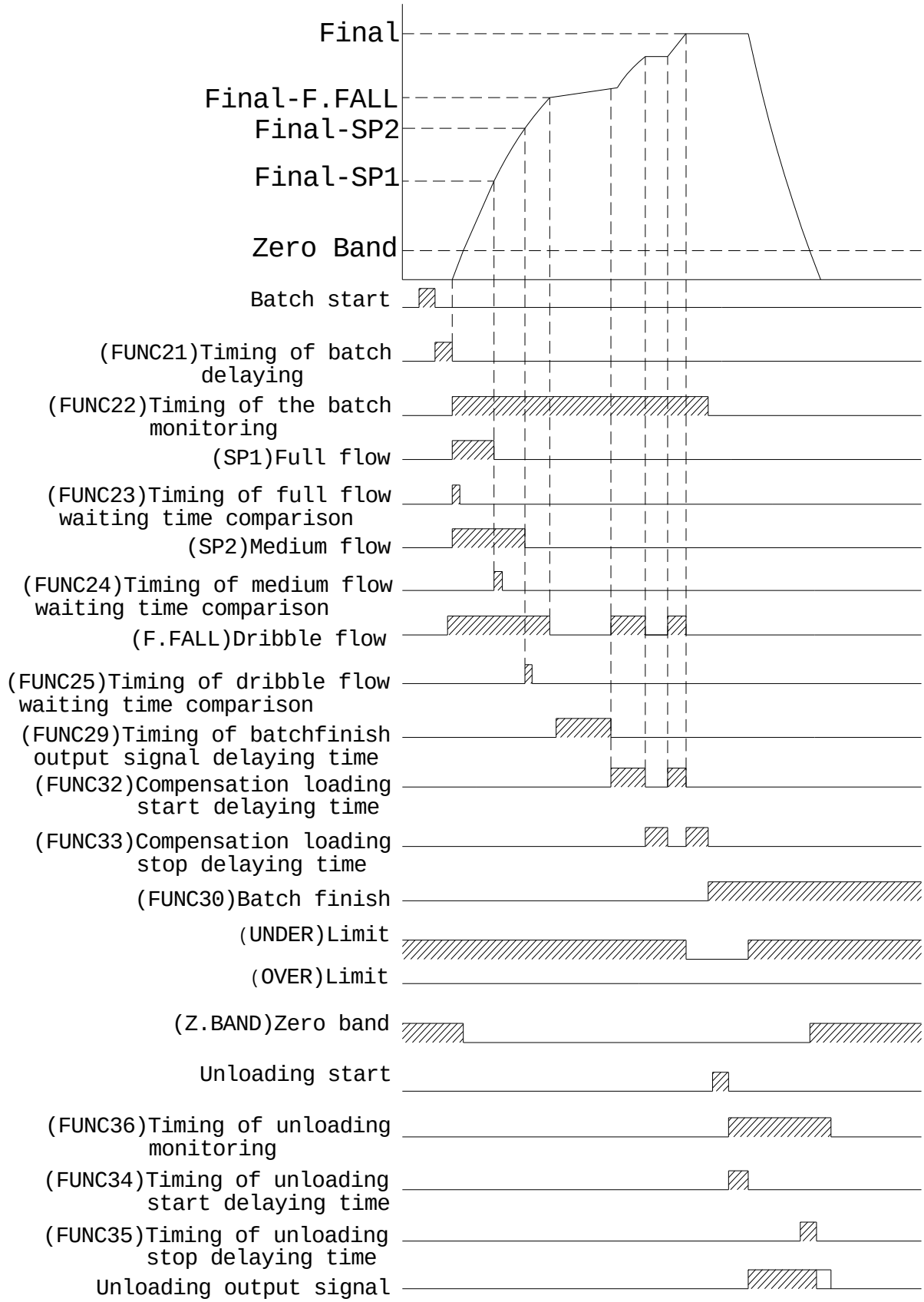
MODE 1

1. Input the batch start signal, this activates the batch start delay time (Func.21).
2. When the batch start delay time reaches zero the following steps take place:
   a) Start the batch time monitoring function. (Func.22)
   b) SP1, SP2 and F.FALL output signals are turned ON.
   c) Start SP1 (full flow) trip comparison delay timer. (Func.23)
3. When the weight reaches (Final-SP1) trip value.
   a) The full flow (SP1) output is turned off.
   b) Start SP2 (medium flow) trip comparison delay timer. (Func.24)
4. When the weight reaches (Final-SP2) trip value.
   a) The medium flow (SP2) output is turned off.
   b) Start F.FALL (dribble flow) trip comparison delay timer. (Func.25)
5. When the weight reaches (Final-F.FALL) trip value.
   a) The dribble flow (F.FALL) output is turned off.
   b) Start the batch finish output signal delay timer. (Func.29)
6. When the batch finish output signal delay timer reaches zero, if
   a) Func.28 = 0 then the batch finish output signal is tuned on.
   b) Func.28 = 1 then the batch finish output signal is only tuned on once the weight is steady.
7. When the batch finish output signal is tuned on
   a) Func.37 = 1 then the over/under signal is output.
   b) The auto in-flight (free flow) compensation is calculated.
   c) Deactivate and reset the batch time monitoring timer.
   d) Outputs the weighing data (if auto-transmit mode enabled) Via the RS-232, RS-422, RS-485 and BCD interfaces (if fitted).
   e) Auto-totalisation of weighings and weight. (Func. 39)
8. Activates the unloading start delaying time when the start unloading input signal is activated. (Func.34)
9. When the unloading start delay time reaches zero the following occurs:-
   a) Start the max unloading time timer. (Func.36)
   b) Switch on the Unloading output signal.
10. When the gross weight is within the zero range,
   a) Stop the unloading timer.
   b) Start the unloading stop delay time timer. (Func.35)
11. The unloading signal is turned off when the unloading stop delay timer reaches zero.


Final
Final-F.FALL
Final-SP2
Final-SP1
Zero Band
Batch start
(FUNC21)Timing of batch start delaying
(FUNC22)Timing of batch monitoring
(SP1)Full flow
(FUNC23)Timing of full flow waiting time comparison
(SP2)Medium flow
(FUNC24)Timing of medium flow waiting time comparison
(F.FALL)Dribble flow
(FUNC25)Timing of dribble flow waiting time comparison
(FUNC29)Timing of batch finish output signal delaying time
(FUNC30)Batch finish
(UNDER)Limit
(OVER)Limit
(Z.BAND)Zero band
Unloading start
(FUNC36)Timing of unloading monitoring
(FUNC34)Timing of unloading start delaying time
(FUNC34)Timing of unloading stop delaying time
Unloading signal output

MODE 2 (SUPPLEMENTARY LOADING)

1. Input the batch start signal, this activates the batch start delay time (Func.21).
2. When the batch start delay time reaches zero the following steps take place:
    a) Start the batch time monitoring function. (Func.22)
    b) SP1, SP2 and F.FALL output signals are turned ON.
    c) Start SP1 (full flow) trip comparison delay timer. (Func.23)
3. When the weight reaches (Final-SP1) trip value.
    a) The full flow (SP1) output is turned off.
    b) Start SP2 (medium flow) trip comparison delay timer. (Func.24)
4. When the weight reaches (Final-SP2) trip value.
    a) The medium flow (SP2) output is turned off.
    b) Start F.FALL (dribble flow) trip comparison delay timer. (Func.25)
5. When the weight reaches (Final-F.FALL) trip value.
    a) The dribble flow (F.FALL) output is turned off.
    b) Start the batch finish output signal delay timer. (Func.29)
6. When the batch finish output signal delay timer reaches zero and the weight is stable. (Func.28 = 1)
    a) The auto-free fall compensation is calculated and the net weight value is checked against the under limit.
    b) The dribble flow (F.FALL) output is switched on.
    c) The supplementary loading gate open timer is started. (Func.32)
7. When the supplementary loading gate open timer reaches zero.
    a) The dribble flow (F.FALL) output is switched off.
    b) The supplementary loading gate close timer is started. (Func.33)
8. When the supplementary loading gate close timer reaches zero, if the net weight value is less than the under limit and the number of supplementary loading cycles (Func.31) has not yet been completed, then steps 6-b), c), 7 and 8 are repeated.
9. When the net weight value is equal to or greater than the under limit.
    a) The batch finish output is turned on.
    b) If Func.37 = 1 then the over/under signal is output.
    c) Deactivate and reset the batch time monitoring timer.
    d) Outputs the weighing data (if auto-transmit mode enabled) Via the RS-232, RS-422, RS-485 and BCD interfaces (if fitted).
    e) Auto-totalisation of weighings and weight. (Func. 39)
10. Activates the unloading start delaying time when the start unloading input signal is activated. (Func.34)
11. When the unloading start delay time reaches zero the following occurs:-
    a) Start the max unloading time timer. (Func.36)
    b) Switch on the Unloading output signal.
12. When the gross weight is within the zero range,
    a) Stop the unloading timer.
    b) Start the unloading stop delay time timer. (Func.35)
13. The unloading signal is turned off when the unloading stop delay timer reaches zero.


Final
Final-F.FALL
Final-SP2
Final-SP1
Zero Band
Batch start
(FUNC21)Timing of batch delaying
(FUNC22)Timing of the batch monitoring
(SP1)Full flow
(FUNC23)Timing of full flow waiting time comparison
(SP2)Medium flow
(FUNC24)Timing of medium flow waiting time comparison
(F.FALL)Dribble flow
(FUNC25)Timing of dribble flow waiting time comparison
(FUNC29)Timing of batchfinish output signal delaying time
(FUNC32)Compensation loading start delaying time
(FUNC33)Compensation loading stop delaying time
(FUNC30)Batch finish
(UNDER)Limit
(OVER)Limit
(Z.BAND)Zero band
Unloading start
(FUNC36)Timing of unloading monitoring
(FUNC34)Timing of unloading start delaying time
(FUNC35)Timing of unloading stop delaying time
Unloading output signal

7-4-4 BUILT-IN DISCHARGING BATCH PROCEDURE (FUNC. 20 = 3)

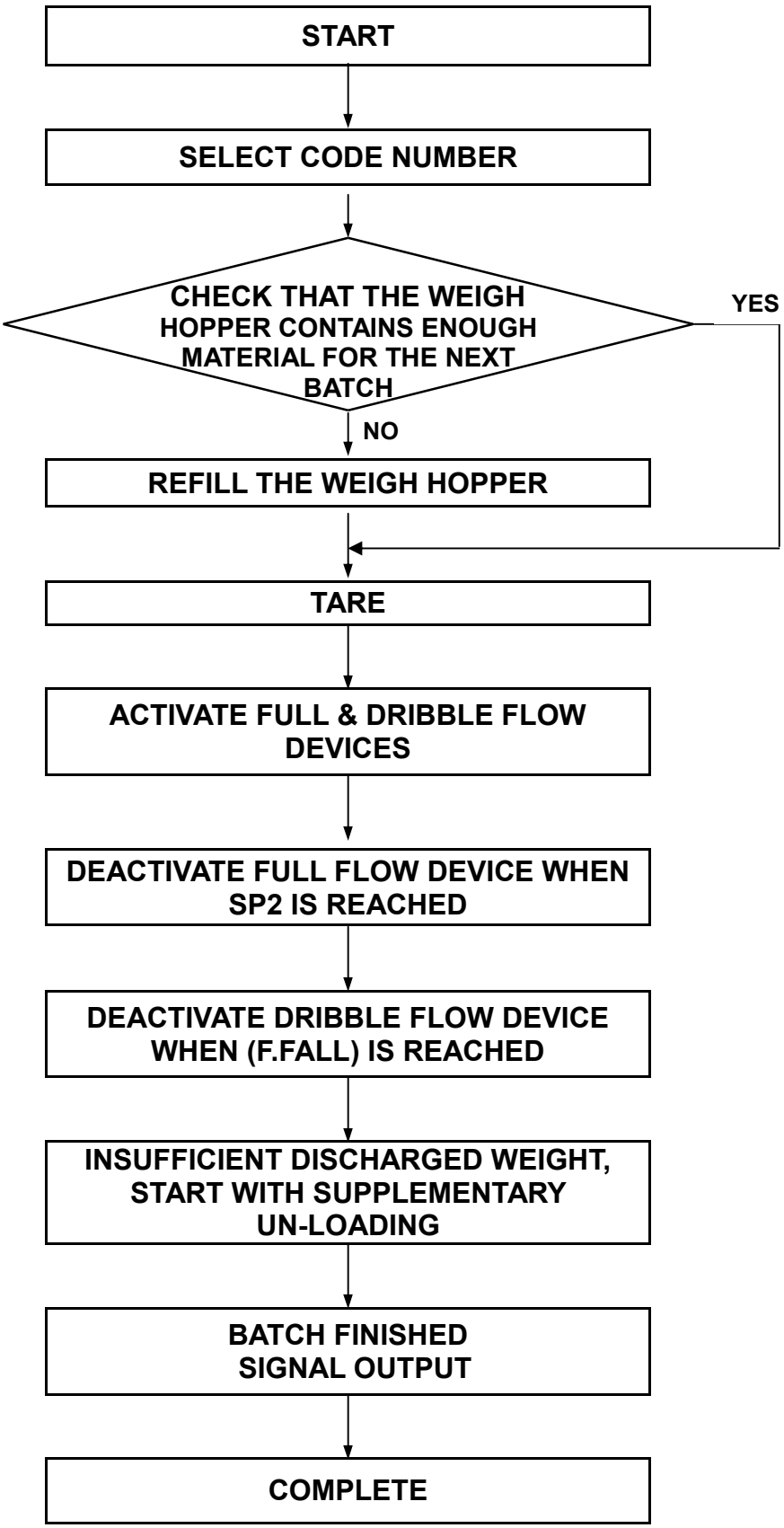
OUTPUT SIGNAL CONDITION:

SIGNAL	OUTPUT CONDITION	ON/OFF STATUS		
		RELAY OUTPUT		FRONT PANEL LED INDICATION LIGHT
		FUNC. 50 = 00000000	FUNC. 50 = 11111111	
F.FALL (dribble)	-NET ≥ Final – F.FALL	OFF	ON	OFF
SP2 (full flow)	-NET ≥ Final – SP2	OFF	ON	OFF
SP1 (supply)	Gross ≥ SP1	OFF	ON	OFF
UNDER	-NET < Final - UNDER	ON	OFF	ON
OVER	-NET > Final + OVER	ON	OFF	ON
Zero Band	Gross ≤ Zero Band	ON	OFF	ON

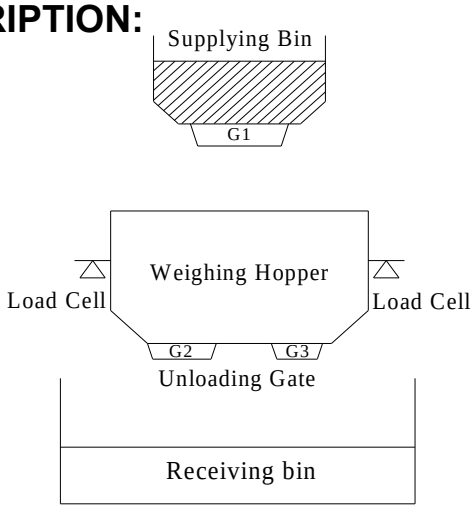
4 The full and dribble flow display LED's and relay outputs are ON after the start input signal has been applied. The outputs and LED's switch OFF when the weight reaches the appropriate trip value.
Under / over / z.band (zero band) display LED's and relay outputs switch ON when their respective conditions are met.

4 Func.50 is used to select the relay signal output logic.
Each selection of the output signals can be modified by using Func.51~58.

BATCH PROCEDURE CHART:



FUNCTIONAL DESCRIPTION:



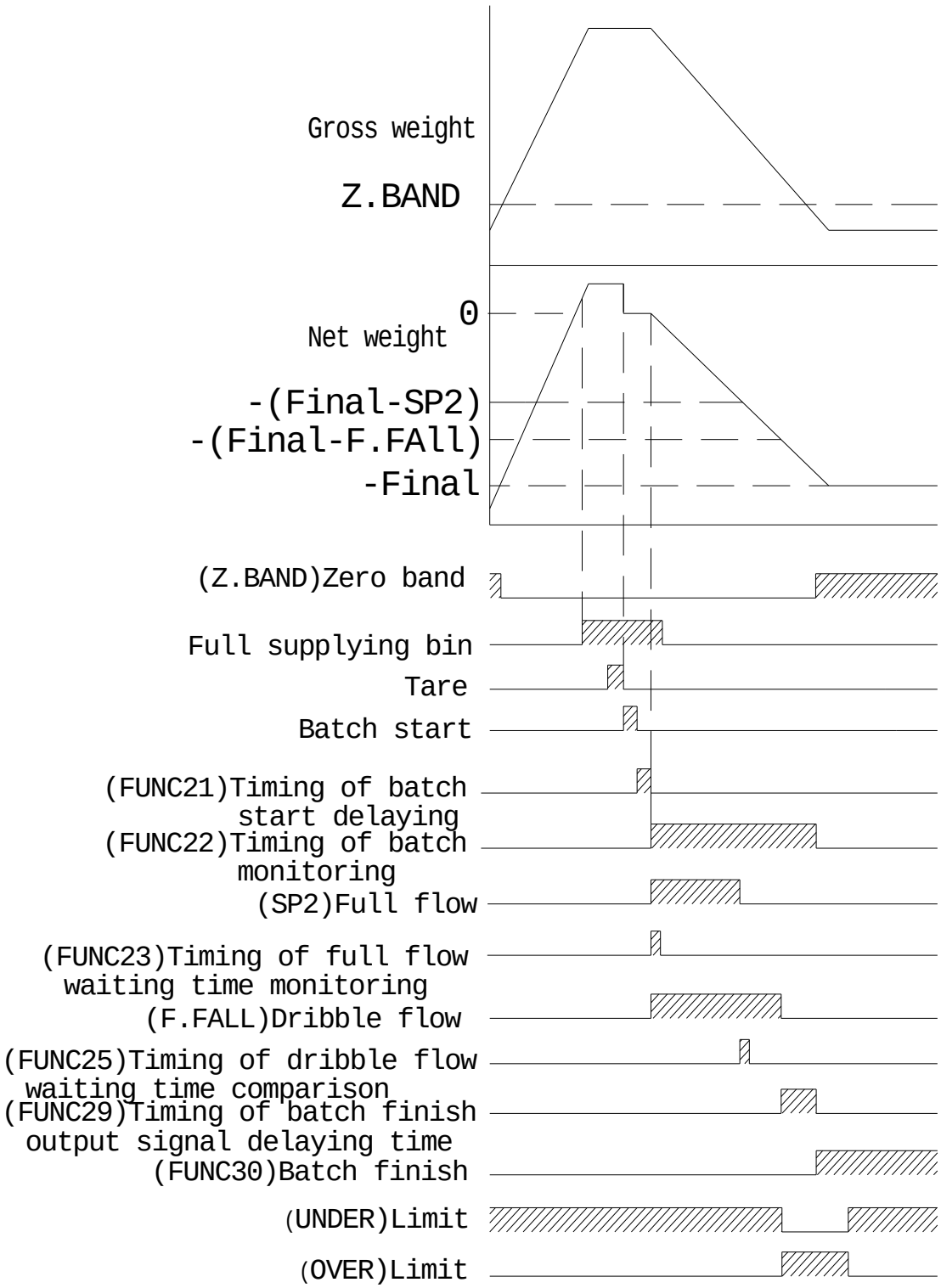
G1:Supplying bin gate (SP1)

G2:Full flow gate of weighing bin (SP2)

G3:Dribble flow gate of weighing (F.FALL)

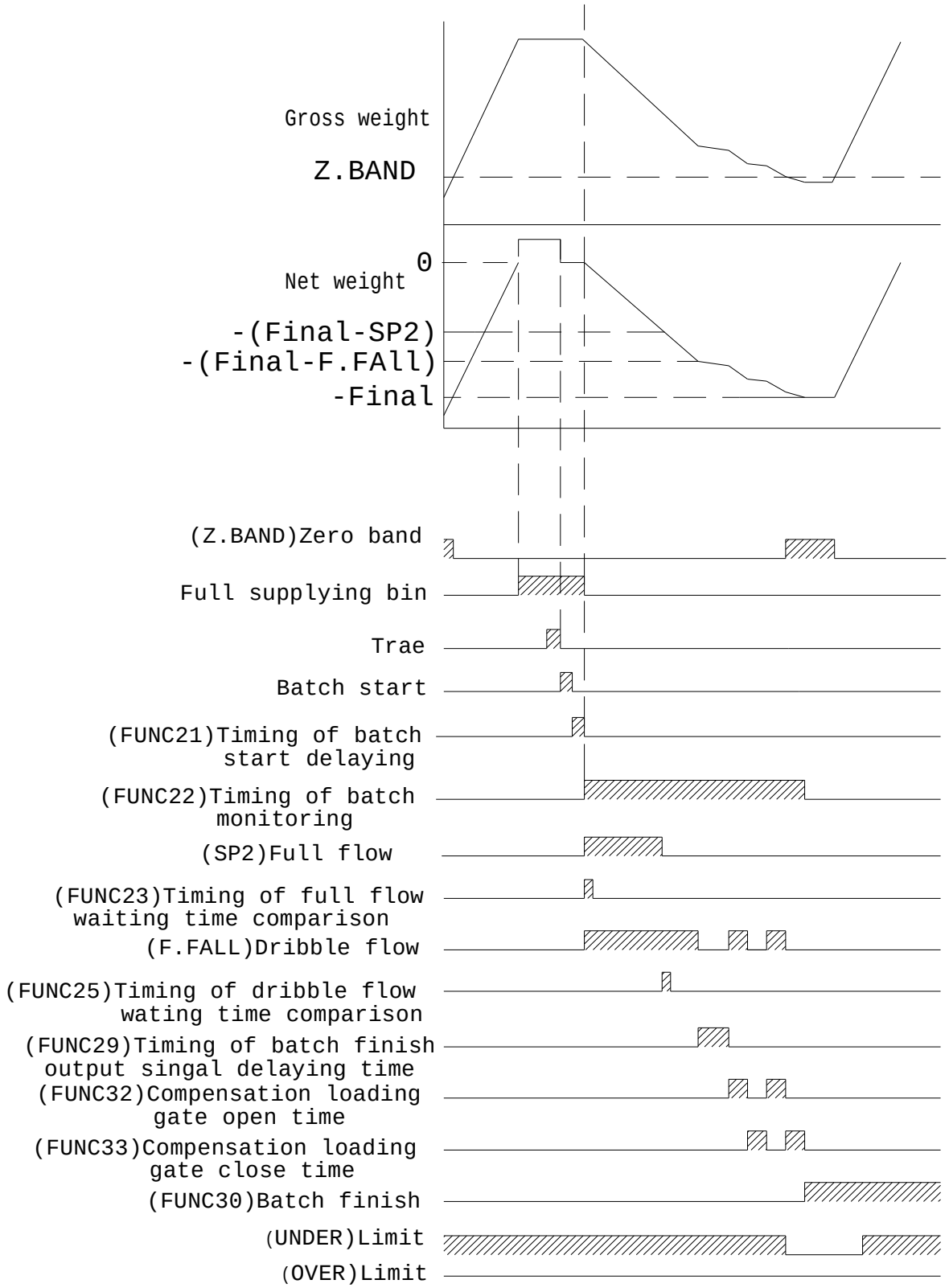
MODE 1

1. Check if in the weigh hopper has enough material for the next batch, if not, fill the weigh hopper with material by opening gate G1. G1 is closed after the gross weight reaches SP1 (hopper full).
2. Tare and input the batch start signal and start the batch start delay timer (Func.21).
3. When the batch start delay timer reaches zero.
   a) Start the batch time monitoring function (Func.22).
   b) Full flow and dribble flow output signals are turned ON.
   c) Start the full flow trip comparison delay timer (Func.24).
4. When the weight reaches (Final-SP2) trip value.
   a) The full flow (SP2) output is turned off.
   b) Start F.Fall (dribble flow) trip comparison delay timer (Func.25).
5. When the weight reaches (Final-F.FALL) trip value.
   a) The dribble flow output is turned off.
   b) Start the batch finish output signal delay timer (Func.29).
6. When the batch finish output signal delay timer reaches zero and the weight is stable. (Func.28 = 1)
   a) Func.37 = 1 then the over/under signal is output.
   b) The auto-free fall compensation is calculated.
   c) Deactivate and reset the batch time monitoring timer.
   d) Outputs the weighing data (if auto-transmit mode enabled) via the RS-232, RS-422, RS-485 and BCD interfaces (if fitted).
   e) Auto-totalisation of weighings and weight. (Func. 39)


Gross weight
Z.BAND
0
Net weight
-(Final-SP2)
-(Final-F.FAll)
-Final
(Z.BAND)Zero band
Full supplying bin
Tare
Batch start
(FUNC21)Timing of batch start delaying
(FUNC22)Timing of batch monitoring
(SP2)Full flow
(FUNC23)Timing of full flow waiting time monitoring
(F.FALL)Dribble flow
(FUNC25)Timing of dribble flow waiting time comparison
(FUNC29)Timing of batch finish output signal delaying time
(FUNC30)Batch finish
(UNDER)Limit
(OVER)Limit

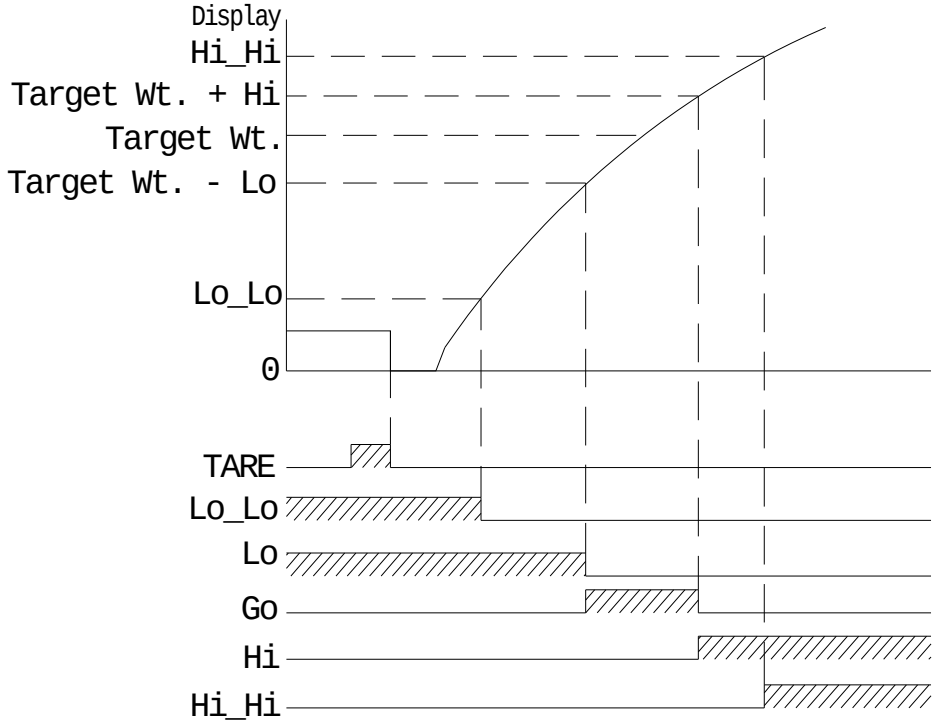
MODE 2 (SUPPLEMENTARY LOADING)

1. Check if in the weigh hopper has enough material for the next batch, if not, fill the weigh hopper with material by opening gate G1. G1 is closed after the gross weight reaches SP1 (hopper full).
2. Tare and input the batch start signal and start the batch start delay timer (Func.21).
3. When the batch start delay timer reaches zero.
   a) Start the batch time monitoring function (Func.22).
   b) Full flow and dribble flow output signals are turned ON.
   c) Start the full flow trip comparison delay timer (Func.24).
4. When the weight reaches (Final-SP2) trip value.
   a) The full flow (SP2) output is turned off.
   b) Start F.Fall (dribble flow) trip comparison delay timer (Func.25).
5. When the weight reaches (Final-F.FALL) trip value.
   a) The dribble flow output is turned off.
   b) Start the batch finish output signal delay timer (Func.29).
6. When the batch finish output signal delay timer reaches zero and the weight is stable. (Func.28 = 1)
   a) The auto-free fall compensation is calculated. Check if the net weight value is lower than the ‘under' limit. If so then b) & c) below are performed.
   b) The dribble flow output is turned on
   c) Start the supplementary loading open gate timer (Func.32).
7. When the supplementary loading open gate timer reaches zero.
   a) The dribble flow (F.FALL) output is turned off.
   b) The supplementary loading close gate timer is started (Func.33)
8. When the supplementary loading close gate timer reaches zero, if the net weight value is lower than the ‘under’ limit and number of supplementary loading cycles has not yet been completed, then repeat steps 6 b), c), 7 &8.
9. When the supplementary loading close gate timer reaches zero, if the net weight value is greater or equal to the ‘under’ limit.
   a) The batch finished signal is turned on.
   b) Func.37 = 1 then the over/under signal is output.
   c) Deactivate and reset the batch time monitoring timer.
   d) Outputs the weighing data (if auto-transmit mode enabled) Via the RS-232, RS-422, RS-485 and BCD interfaces (if fitted).
   e) Auto-totalisation of weighings and weight. (Func. 39)


Gross weight
Z.BAND
0
Net weight
-(Final-SP2)
-(Final-F.FAll)
-Final
(Z.BAND)Zero band
Full supplying bin
Trae
Batch start
(FUNC21)Timing of batch start delaying
(FUNC22)Timing of batch monitoring
(SP2)Full flow
(FUNC23)Timing of full flow waiting time comparison
(F.FALL)Dribble flow
(FUNC25)Timing of dribble flow wating time comparison
(FUNC29)Timing of batch finish output singal delaying time
(FUNC32)Compensation loading gate open time
(FUNC33)Compensation loading gate close time
(FUNC30)Batch finish
(UNDER)Limit
(OVER)Limit

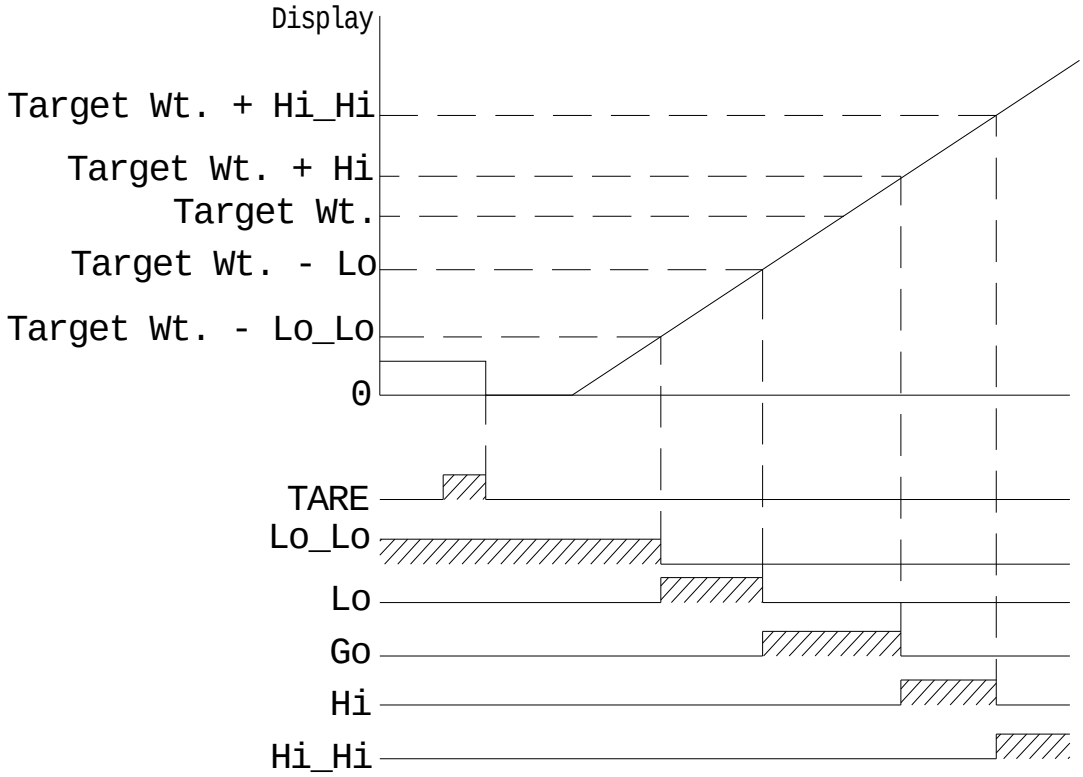
7-5 CHECK MODE OPERATION

7-5-1 CHECK MODE 1 (FUNC.20 = 4)



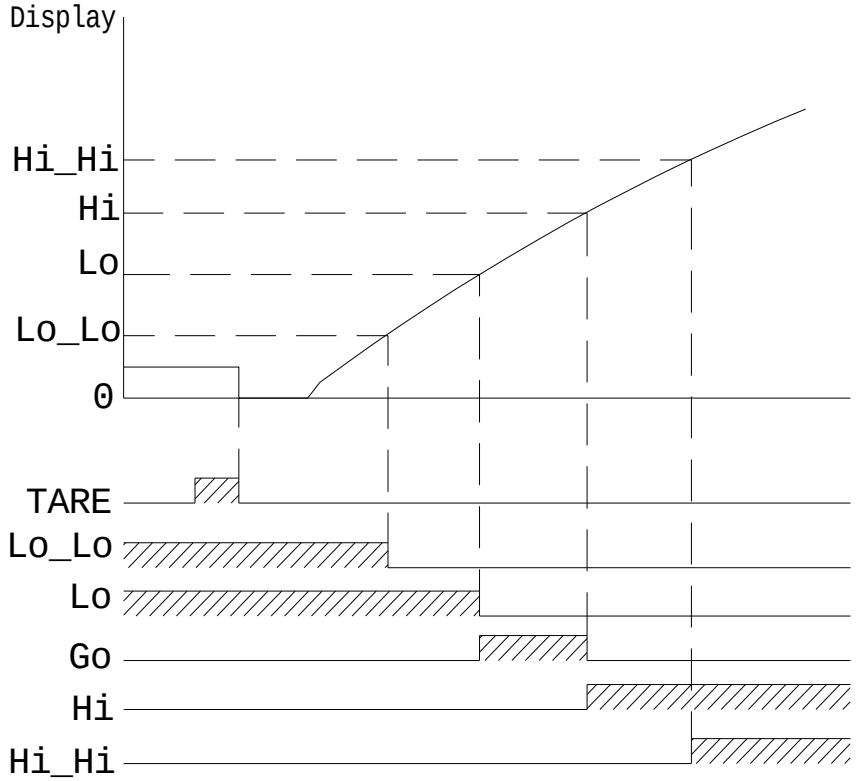
SIGNAL	OUTPUT CONDITION	ON/OFF STATUS		
		RELAY OUTPUT		FRONT PANEL LED INDICATION LIGHT
		FUNC. 50 = 00000000	FUNC. 50 = 11111111	
Lo - Lo	NET < Lo - Lo	ON	OFF	ON
Lo	NET < Target Wt. – Lo	ON	OFF	ON
Go	Target Wt. + Hi ≥ NET ≥ Target Wt. – Lo	ON	OFF	ON
Hi	NET > Target Wt. + Hi	ON	OFF	ON
Hi - Hi	NET > Hi - Hi	ON	OFF	ON
Zero Band	Gross ≤ Zero Band	ON	OFF	ON

7-5-2 CHECK MODE 2 (FUNC.20 = 5)



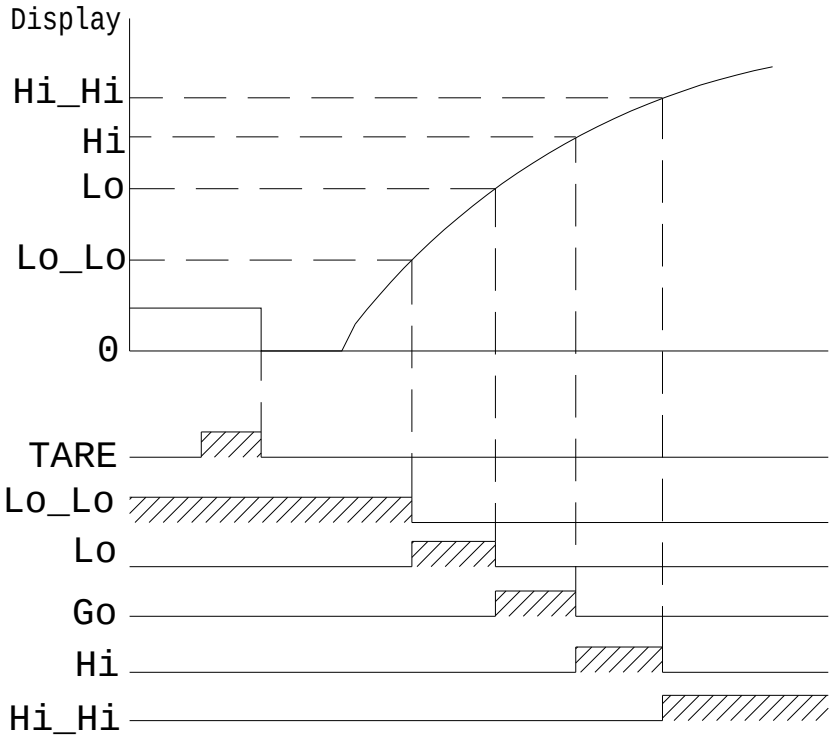
SIGNAL	OUTPUT CONDITION	ON/OFF STATUS		
		RELAY OUTPUT		FRONT PANEL LED INDICATION LIGHT
		FUNC. 50 = 00000000	FUNC. 50 = 11111111	
Lo - Lo	NET < Lo - Lo	ON	OFF	ON
Lo	Target Wt. – Lo > NET ≥ Target Wt. – Lo - Lo	ON	OFF	ON
Go	Target Wt. + Hi ≥ NET ≥ Target Wt. – Lo	ON	OFF	ON
Hi	Target Wt. + Hi - Hi ≥ NET > Target Wt. + Hi	ON	OFF	ON
Hi - Hi	NET > Hi - Hi	ON	OFF	ON
Zero Band	Gross ≤ Zero Band	ON	OFF	ON

7-5-3 CHECK MODE 3 (FUNC.20 = 6)



SIGNAL	OUTPUT CONDITION	ON/OFF STATUS		
		RELAY OUTPUT		FRONT PANEL LED INDICATION LIGHT
		FUNC. 50 = 00000000	FUNC. 50 = 11111111	
Lo - Lo	NET < Lo - Lo	ON	OFF	ON
Lo	NET < Lo	ON	OFF	ON
Go	Hi ≥ NET ≥ Lo	ON	OFF	ON
Hi	NET > Hi	ON	OFF	ON
Hi - Hi	NET > Hi - Hi	ON	OFF	ON
Zero Band	Gross ≤ Zero Band	ON	OFF	ON

7-5-4 CHECK MODE 4 (FUNC.20 = 7)



SIGNAL	OUTPUT CONDITION	ON/OFF STATUS		
		RELAY OUTPUT		FRONT PANEL LED INDICATION LIGHT
		FUNC. 50 = 00000000	FUNC. 50 = 11111111	
Lo - Lo	NET < Lo - Lo	ON	OFF	ON
Lo	Lo > NET ≥ Lo - Lo	ON	OFF	ON
Go	Hi ≥ NET ≥ Lo	ON	OFF	ON
Hi	Hi - Hi ≥ NET > Hi	ON	OFF	ON
Hi - Hi	NET > Hi - Hi	ON	OFF	ON
Zero Band	Gross ≤ Zero Band	ON	OFF	ON

7-6 NOTES

2 AUTO-TRANSFER

Auto-transfer is the data transfer mode of the RS-232, RS-422, RS-485 and BCD interfaces.

The data transmission depends on which weighing mode is being used.

a) Normal loading batch / loss-in-weight:-
The net weight value has to be greater than four times the minimum scale division and the full, medium and dribble flow set-point outputs have all operated, then the data is output once. No more data is output until the net weight value has returned to less than four times the minimum scale division.

b) Built-in loading batch / loss-in-weight modes:-
The data is output once when the batch finish signal is switched ON.

c) Check mode:-
The data is output once when the net weight value is greater than four times the minimum scale division. No more data is output until the net weight value has returned to less than four times the minimum scale division.

2 AUTO-FREE FALL (in-flight) COMPENSATION

Auto-free fall compensation adjusts the next free fall value depending on the average of the previous four error values. It is achieved by the use of a four stage history buffer. When a new value is inserted into the buffer the previous values are shuffled down the buffer and the oldest value is discarded.
If the actual free fall value for the current batch is outside of the auto in-flight compensation active window weight (Func.27), then it is not added to the buffer and the next batch will have the previous error correction factor applied to the final trip value.

2 AUTO-TOTALISATION OF WEIGHT AND NUMBER OF WEIGHINGS

When Func. 39 = 1 the number of weighings and weight will be totalised when:-

a) Normal loading batch/loss-in-weight
The net weight value is greater than four times the minimum scale division and the full, medium and dribble flow outputs have all operated, totalise the current net weight value and add one to the number of weighings. Totalisation is then inhibited until the net weight value returns to less than four times the minimum scale division.

b) Built-in loading batch/loss-in-weight procedure.
Totalise the current net weight value and add one to the number of weighings when the end of batch signal is tuned ON.

c) Check mode
The net weight value is greater than four times the minimum scale division, totalise the current net weight value and add one to the number of weighings. Totalisation is then inhibited until the net weight value returns to less than four times the minimum scale division.

CHAPTER 8 COUNTING, HOLD AND PRESET-TARE MODES

8-1 COUNTING MODE

8-1-1 DISPLAY

* Unit weight and Quantity are shown on the sub display. Using FUNC. 12, parameter 8 to switch between Unit weight and Quantity or press F or F1 to switch. (Func. 13, 14, parameter 10)

* The maximum Unit Weight display is 7 digits, and the minimum is 0.1d. (d=division)

* The Unit Weight Mode mark shows on the left hand side of the sub display.

* The maximum Quantity display is 7 digits, and the Quantity mode mark shows on the sub display. (When the weight is negative, the mark shows)

8-1-2 UNIT WEIGHT INPUT AND SAMPLING

Using FUNC. 13, 14 or F F1 to set up the modes:

a). Unit Weight Mode

Step 1: In the Unit Weight Mode, press UNIT WEIGHT INPUT key.

Step 2: Key in the number (Using →T← TARE > →0← ZERO < Net/B/G ^ F v)

Step 3: Press ↵ ENTER key to confirm, or press I/⏻ ESC to abandon.

** The Unit Weight is based on the net weight.

b) Sampling

Step 1: In the Counting Mode, press Sampling key.

Step 2: Key in the number (Using →T← TARE > →0← ZERO < Net/B/G ^ F v)

Step 3: Press ↵ ENTER key to confirm, or press I/⏻ ESC to abandon.

c) Error Message

Error 10 — 1) Sampling or Unit weight is zero.
2) The net weight is negative.
3) The unit weight is bigger than allowed. (7 digits)

Error 11 — The unit weight is lower than 0.1d (d is division)

8-1-3 QUANTITY COMPARISON

2 When the FUNC. 19 is set as 1, it means that all the setting as based on the quantity in the counting mode. Therefore in the batching mode or checking mode, the comparison is based on the quantity.

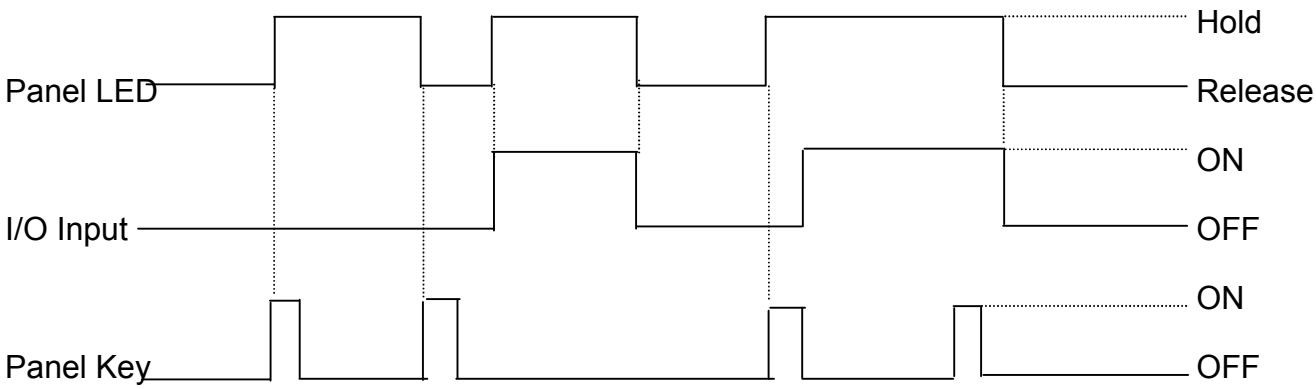
8-2 HOLD MODE

* To activate the HOLD Mode, press the front panel key or use the External I/O input terminal.

* To exit the Use the key on HOLD MODE, press the front panel key again.

* Use the External I/O input terminal to enter the HOLD MODE, the input signal as ON with a short circuit between the appropriate I/O Input and C2. To return to the WEIGHING MODE, switch the I/O input signal OFF. (Open circuit between I/O Input and C2).

* The External I/O input terminal has priority over the front panel key.



2 Three types of HOLD MODE

a) Ordinary Hold (FUNC. 15, parameter 0)
When entering this mode, the weight is held while the hold mode is active.

b) Peak Hold (FUNC. 15, parameter 1)
When entering this mode, the display holds and displays the maximum weight value achieved.

c) Absolute Peak Hold (FUNC. 15, parameter 2)
When entering this mode, the display shows the absolute maximum weight. NOTE: The any negative weight is not included.

8-3 PRESET-TARE MODE

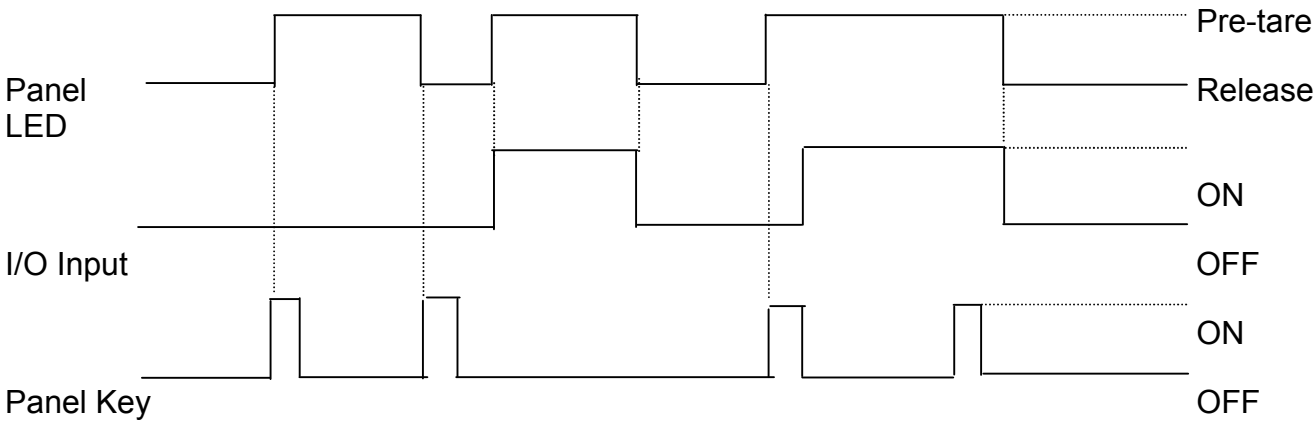
a) Two types of Preset-tare operation
1) Preset-tare gross FUNC. 16, parameter 0
2) Preset-tare percentage FUNC. 16, parameter 1

b) 2 ways to input the preset-tare value
1) FUNC. 84, parameter 2 Input the value from the Numerical Switch Interface (OP-04), and the front panel status is invalid. (Please refer to Chapter 10-6)
2) FUNC. 84, parameter is not 2 Use F / F1 on the front panel to input the value. (FUNC. 13, parameter 12 & FUNC. 14 parameter 13)

4 In the 1st way to input the preset-tare value:
Preset-tare gross range is in 0~99999.
Preset-tare percentage range is 0~99.99%

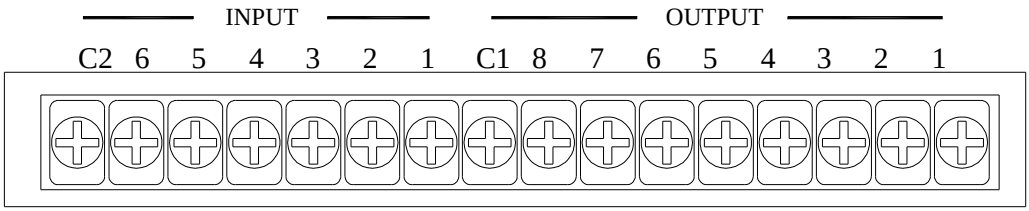
4 In the 2nd way to input the preset-tare value:
Preset-tare gross range is in 0~999999.
Preset-tare percentage range is 0~99.99%

c) Use F / F1 (FUNC. 13, 14, parameter 13) to select the Preset-tare function (toggle ON/OFF). To use the Preset-tare function, press the key and the NET LED will light when the tare is active. To exit the function, press the key again. The Preset-tare function can also be selected by using an Ext. I/O terminal input.

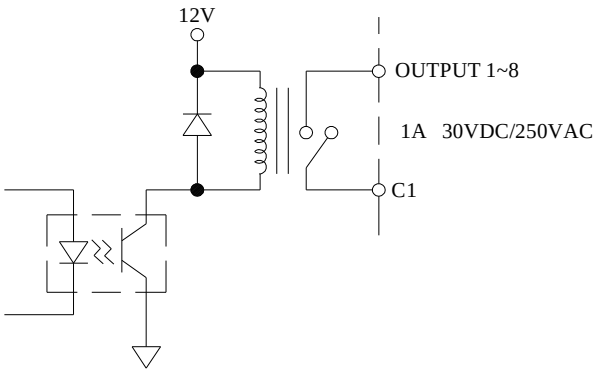


CHAPTER 9 INTERFACE

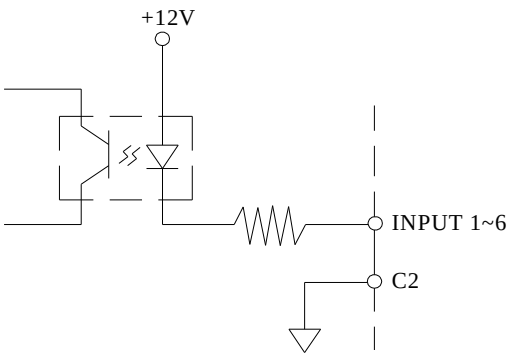
9-1 EXTERNAL CONTROL INPUT AND RELAY OUTPUT



REAR PANEL OUTPUT/INPUT TERMINALS



RELAY OUTPUT CIRCUIT



CONTROL INPUT CIRCUIT

CONTROL INPUT TERMINAL FUNCTION SELECTION TABLE

PARAMETER	FUNCTION NAME	READ TYPE	DESCRIPTION
0	Not in use		
1	Zero	Rise edge	Sets gross weight to zero if it is within the range set in Func.2
2	Tare	Rise edge	Performs a semi-auto tare.
3	Clear Tare	Rise edge	Clears the tare value and sets display in gross mode.
4	Batch Start	Rise edge	Executes activation procedure of the built-in batching sequence.
5	Batch Stop	Rise edge	Executes deactivation procedure of the built-in batching mode.
6	Unload Start	Rise edge	Executes activation of the unloading procedure of the built-in loading batch mode.
7	Print	Rise edge	Executes manual output of serial and parallel data.
8	Totalise Command	Rise edge	Totalise the current net weight and increment the number of weighings counter.
9	Cancel Totalise	Rise edge	Cancel previous totalised weight and subtract one from the number of weighings.
10	Clear Total	Rise edge	Set both the weight totaliser and number of weighings to zero.
11	Hold	+ Voltage level	Activate the hold mode
12	Preset-tare	+ Voltage level	Activate the preset-tare

4 Input functions are configured by Func.41~46.

OUTPUT TERMINAL FUNCTION SELECTION TABLE

PARAMETER	FUNCTION NAME	DESCRIPTION
0	Not in use	
1	Zero Band	Works as zero point reference when the gross weight is within the zero band range in the control procedure
2	Under	Works as under limit signal in weighing mode
	Hi - Hi	Works as Hi-Hi signal in check weighing mode
3	Over	Works as over limit signal in weighing mode.
	Hi	Works as Hi signal in check weighing mode
4	SP1	Works as full flow signal in loading batch mode. Works as fill weigh hopper signal in loss-in weight mode.
	Go	Works as Go signal in check weighing mode
5	SP2	Works as medium flow signal in loading batch mode. Works as full flow signal in loss-in-weight mode.
	Lo	Works as Lo signal in check weighing mode.
6	Free Fall	Works as dribble flow signal in weighing mode.
	Lo – Lo	Works as Lo-Lo signal in check weighing mode.
7	Unloading	Unloading output signal
8	Batch Finish	Signals the end of the batch cycle.
9	Stable	Output is on when the weight is stable.
10	Running Built-in weighing procedure	Used to signal that a weighing cycle is operating.
11	Error Built-in unusual weighing procedure	An error has occurred during the weighing cycle.
12	External input signal acknowledge	If control input signal is ON externally then the acknowledge signal is ON. If control input signal is OFF externally then the acknowledge signal is OFF.
13	Weighing Capacity Overflow	Is turned ON when the gross weight is greater than the maximum capacity.
14	Battery Low	Memory battery is low. Refer to 10-7 for maintenance

4 a) Output functions are configured in Func.51~58.
b) Use Func.50 to set relay output configuration (normal open/normal closed).

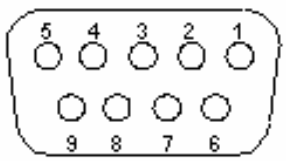
9-2 RS-232C AND CURRENT LOOP SERIAL INTERFACES

Use the interface to connect related external equipment such as a PLC, printer or Personal Computer (PC) to the EX2000S.

Bi-directional (Full duplex) data via the RS-232C interface.
Transmit only (half duplex) data via the current loop interface.
The serial transmission data is fed to both the current loop and RS-232C interfaces in parallel. The current loop interface is passive and requires external power to operate.

INTERFACE	SIGNAL SPECIFICATION	OUTPUT CODE
RS-232C	EIA RS-232C	ASCII
Current Loop	20mA Current Loop 1=20mA , 0=0mA	ASCII

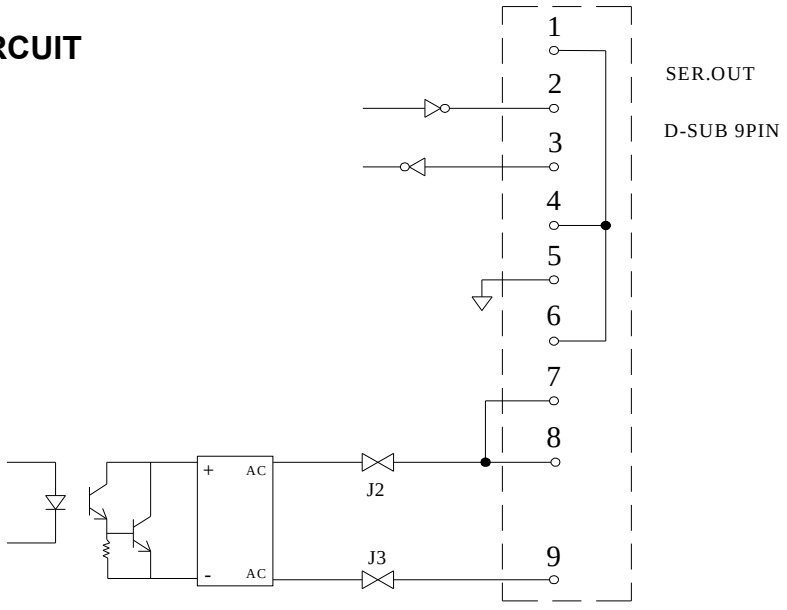
9-2-1 PIN POSITION



REAR PANEL SERIAL OUTPUT

PIN NUMBER	FUNCTION	NOTE
1	-	Pin No. 1, 4 & 6 internal short circuit Pin No. 7 & 8 internal short circuit
2	TXD	
3	RXD	
4	-	
5	SG	
6	-	
7	-	
8	C-Loop	
9	C-Loop	

INTERNAL CIRCUIT



9-2-2 FUNCTION SETTING

ITEM	FUNCTION	SET VALUE			FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION		
FUNC.60	Data type	0	As displayed		0
		1	Gross		
		2	Net		
		3	Tare		
		4	Gross / Net / Tare		
		5	Totalised Weight		
		6	Total Number of weighings		
		7	Totalised Weight and Number of weighings		
FUNC.61	Transfer mode	0	Continuous		0
		1	Auto-transmit		
		2	Manual-transmit		
		3	Command mode		
		4	Fast mode Comparison condition + Gross weight		
		5	Fast mode Comparison condition + Net weight		
FUNC.62	BAUD rate	0	1200		1
		1	2400		
		2	4800		
		3	9600		
		4	19200		
		5	38400		
FUNC.63	Parity bit Data Bits Stop bits	0	N, 8, 1	No parity, 8 data bits, 1 stop bit.	2
		1	O, 7, 1	Odd parity, 7 data bits, 1 stop bit.	
		2	E, 7, 1	Even parity, 7 data bits, 1 stop bit.	
FUNC.64	Finish character	0	CR		1
		1	CR + LF		
FUNC.65	Unstable or Over max. capacity	0	Normal data transmission		0
		1	Inhibit data transmission		

9-2-3 TRANSMITTING DATA FORMAT

2 NORMAL WEIGHING DATA FORMAT

Cond.1		,	Cond. 2		,	Including + / - and decimal point, Weighing data								Units		Finish code	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

2 TOTALS DATA FORMAT

Cond. 2		,	Including + / - and Total weight and number of weighings										Units		Finish code	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

2 SPEED MODE FORMAT

Status byte	Including + / - and decimal point, gross/net weighing data								Finish code	
1	2	3	4	5	6	7	8	9	10	11

2 DESCRIPTION

	OUTPUT	ASCII	DESCRIPTION
Condition 1	OL	4FH, 4CH	Overload weighing
	ST	53H, 54H	Stable weight
	US	55H, 53H	Unstable weight
Condition 2	GS	47H, 53H	Gross weight
	NT	45H, 54H	Net weight
	TR	54H, 52H	Tare
	TW	54H, 57H	Total Weight
	TC	54H, 43H	Number of weighings
Weighing data	0 ~ 9	30H ~ 39H	Weight digit
	+ , -	2BH, 2DH	Positive/Negative
	Blank	20H	Overload weighing
	.	2EH	Decimal
Unit	Blank	20H, 20H	No unit
	Kg	6BH, 67H	Kilogram
	Blank, t	20H, 74H	Tonne
	lb	6CH, 62H	Pound
Finish code	CR	0DH	Data finish code
	CR , LF	0DH, 0AH	
Partition code	,	2CH	

Status byte

b7	b6	b5	B4	b3	b2	b1	b0

b0 Þ Zero Band Zero band
b1 ⇒ Over / Hi-Hi Over limit
b2 ⇒ Under / Hi Under limit
b3 ⇒ SP1 / Go Full flow
b4 ⇒ SP2 / Lo Medium flow
b5 ⇒ Free Fall / Lo-Lo Dribble flow
b6 ⇒ Unloading Unload
b7 ⇒ Batch Finish Batch finish

9-2-4 COMMAND MODE

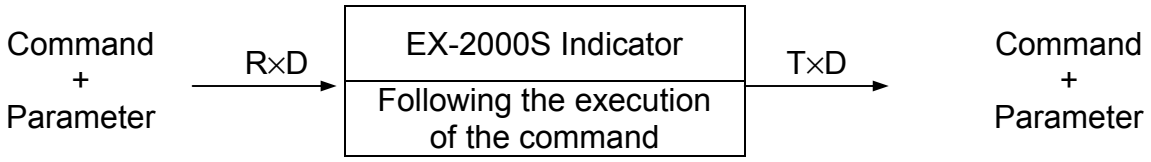
The indicator accepts serial commands when the transfer mode is set to command mode (Func.61). See below for the commands available.

COMMAND	TYPE	FUNCTION
MG	A	Display gross weight
MN	A	Display net weight
MT	A	Semi-auto tare
MZ	A	Clear to zero
CT	A	Clear tare
DT	A	Clear totaliser value to zero
AT	A	Totalise current net weight and increment number of weighings.
RW	B	Read weighing
RT	B	Read current totaliser value, Format is the same as Func. 60 (7)
RB	B	Read current batch's net weight value and the comparison status, same format as Func.61 (5) speed mode
RF	B	Read the previous final batch weight value, output format as Func.60
RS	B	Read trip & control stores, see command description (3) for format reference
BB	A	Batch start
BD	A	Unloading start
HB	A	Batch stop
SS	A	Set trip & control stores, see command description (4) for data format.
ST	A	Subtract previous totalised weight and decrement the number of weighings.

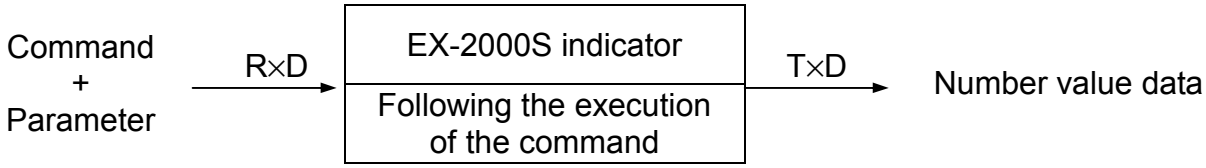
COMMAND DESCRIPTION:

(1) COMMAND TYPE

TYPE "A"



TYPE "B"



NOTE: Depending on the type of command will depend on what data is transmitted.

(2) Commands “RF”, “BB” & “HB” are only available when Func.20 = 2 or 3.
Command “BD” is only available with loading batch mode (Func.20 = 2).

(3) Command “ RS ” data format :

Func.20 = 0 ~ 3

	6 bytes	6 bytes	6 bytes	6 bytes	6 bytes	6 bytes	6 bytes
CD :	Final	F.Fall	SP2	SP1	Under	Over	Z.Band

Func.20 = 4 ~ 7

	6 bytes	6 bytes	6 bytes	6 bytes	6 bytes	6 bytes
CD :	Lo-Lo	Lo	Target	Hi	Hi-Hi	Z.Band

(4) Command “ SS ” data format :

Func.20 = 0 ~ 3

	6 bytes	6 bytes	6 bytes	6 bytes	6 bytes	6 bytes	6 bytes
SS :	Final	F.Fall	SP2	SP1	Under	Over	Z.Band

Func.20 = 4 ~ 7

	6 bytes	6 bytes	6 bytes	6 bytes	6 bytes	6 bytes
SS :	Lo-Lo	Lo	Target	Hi	Hi-Hi	Z.Band

(5) Incorrect types (Error)

E1 : Incorrect command format. e.g. E1:rb<CR>
E2 : The parameter added is out of range.
E3 : Unmatched executive condition.

9-2-5 PROGRAM (EXAMPLE)

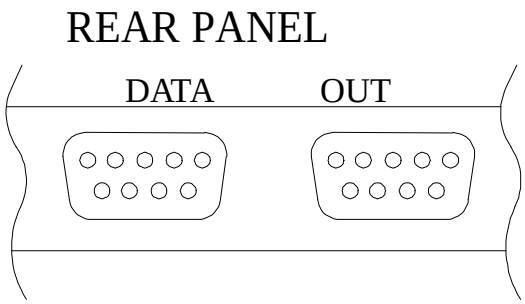
2 SETTING EX2000S

FUNC. No.	SET VALUE	FUNCTION
Func.60	0	Data type and main display work simultaneously
Func.61	0	Continuous data output
Func.62	1	Transfer speed 2400 baud rate
Func.63	2	Data length 7 bit, Even parity, 1 stop bit.
Func.64	0	Character finish CR

9-3 INTERFACE RS-422 / RS-485

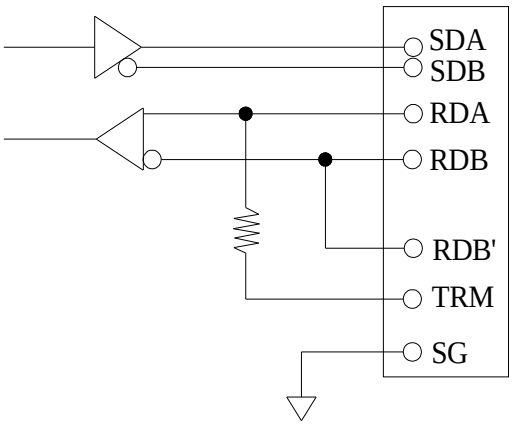
Use these interfaces to connect related external equipment such as PLC or Personal Computer (PC).
The indicator can connect up to ten other serial connections by using these interfaces. The EIA RS-422 or RS-485 interface sends standard ASCII code. The two 9 way 'D' type connectors are connected in parallel to aid daisy chaining to other units. Each transmitter is tri-stated when idle; hence more than one RS422 transmitter can be connected in parallel without damage as each transmitter is only enabled when it has data ready to transmit.
It is important to avoid more than one transmitter being enabled at any given time when units are connected in parallel, that the controlling PLC / computer ensures that all data has been received before issuing a command to receive data from another unit of a different address.
When more than one EX2000S is connected to a network that addressing is implemented (Func.70 = 01 – 99).

9-3-1 PIN ASSIGNMENTS

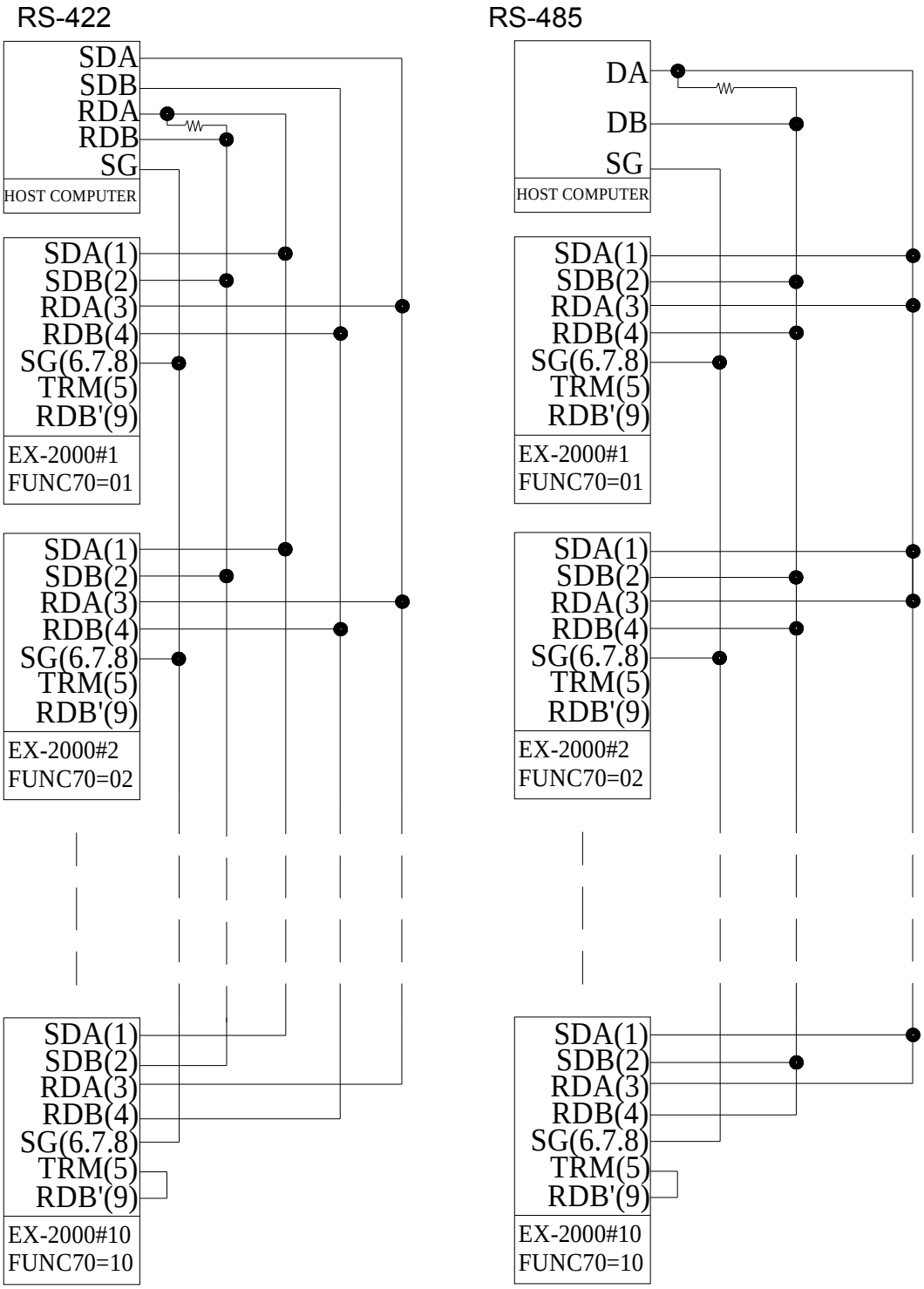


PIN NUMBER	FUNCTION
1	SDA
2	SDB
3	RDA
4	RDB
5	TRM
6	SG
7	
8	
9	RDB'

INTERNAL CIRCUIT



9-3-2 CONNECTION METHOD



2 **NOTE**

- Line terminator resistors are provided in the indicator interface and can be linked in as required in the ‘D’ type connector.
- If the EX2000S is at the end of the transmission line, link the fifth pin (TRM) to the ninth pin (RDB’) in the ‘D’ type connector to connect the terminator resistor.
- The signal ground (SG) need not be connected.

9-3-3 FUNCTION SETTING

ITEM	FUNCTION	SET VALUE			FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION		
FUNC.70	Location	0	Addresses not in use		0
		01 ~ 99	Indicator address		
FUNC.71	Data type	0	As displayed		0
		1	Gross		
		2	Net		
		3	Tare		
		4	Gross / Net / Tare		
		5	Totalised weight		
		6	Number of weighings		
		7	Totalised Weight and Number of weighings		
FUNC.72	Transfer mode	0	Continuous		3
		1	Auto-transmit		
		2	Manual-transmit		
		3	Command mode		
		4	Fast mode Comparison condition + gross wt.		
		5	Fast mode Comparison condition + net weight		
FUNC.73	BAUD rate	0	1200		1
		1	2400		
		2	4800		
		3	9600		
		4	19200		
FUNC.74	Parity bit Data Bits Stop bits	0	N, 8, 1	No parity, 8 data bits, 1 stop bit.	2
		1	O, 7, 1	Odd parity, 7 data bits, 1 stop bit.	
		2	E, 7, 1	Even parity, 7 data bits, 1 stop bit.	
FUNC.75	Finish character	0	CR		1
		1	CR + LF		
FUNC.76	Unstable or Over max. capacity	0	Normal data transmission		0
		1	Inhibit data transmission		

9-3-4 TRANSFER FORMAT

2 Func.70 = 0
When not using addressing refer to section 9-2-3 for data format.

2 Func.70 = 01 ~ 99
The indicator address range is 01 to 99. Each data output will be preceded by an address header of the form " @location ", where 'location' is the address number.

Example:
Func.70 = 01, data output is ***@01 + Output data***
Func.70 = 07, data output is ***@07 + Output data***

9-3-5 COMMAND MODE

2 Func.70 = 01 ~ 99,
When the indicator receives a command it first checks its address, if the address is validated it will then execute the command. See section 9-2-4 RS-232C for a list of commands available.

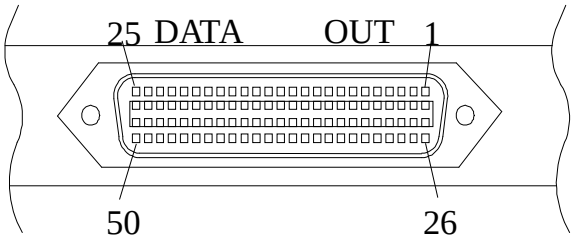
If the computer needs to read address No. 02 indicator's current weight, it sends the command *@02RW<CR><LF>.*

2 Func.70 = 0
When addressing is not being used commands are executed as they are received.

9-4 BCD PARALLEL OUTPUT INTERFACE

9-4-1 PIN POSITION

REAR PENAL

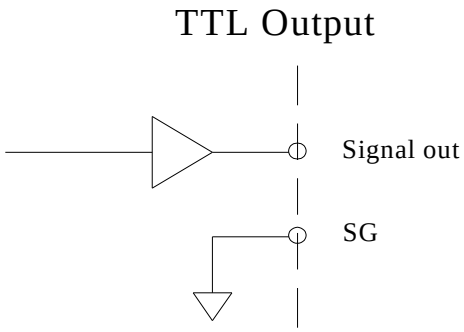


BCD Parallel output interface
Uses Centronic 50PIN connector

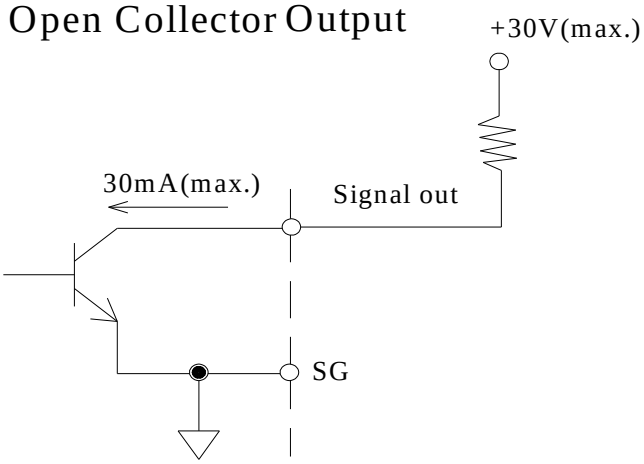
PIN NUMBER	FUNCTION	PIN NUMBER	FUNCTION
1	SG	26	SG
2	1×10^{0}	27	Gross/-NET
3	2×10^{0}	28	
4	4×10^{0}	29	
5	8×10^{0}	30	
6	1×10^{1}	31	
7	2×10^{1}	32	
8	4×10^{1}	33	Stable
9	8×10^{1}	34	
10	1×10^{2}	35	
11	2×10^{2}	36	
12	4×10^{2}	37	
13	8×10^{2}	38	
14	1×10^{3}	39	
15	2×10^{3}	40	
16	4×10^{3}	41	
17	8×10^{3}	42	POSITIVE
18	1×10^{4}	43	$DP10^{1}$
19	2×10^{4}	44	$DP10^{2}$
20	4×10^{4}	45	$DP10^{3}$
21	8×10^{4}	46	$DP10^{4}$
22	1×10^{5}	47	OVER
23	2×10^{5}	48	
24	4×10^{5}	49	Data ready
25	8×10^{5}	50	Hold input

INTERNAL CIRCUIT

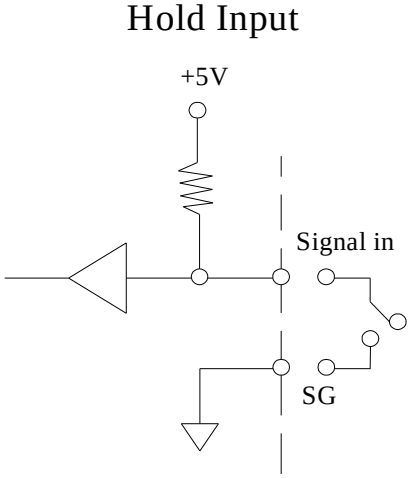
Version 1 - TTL output



Version 2 – Open Collector output



Both versions

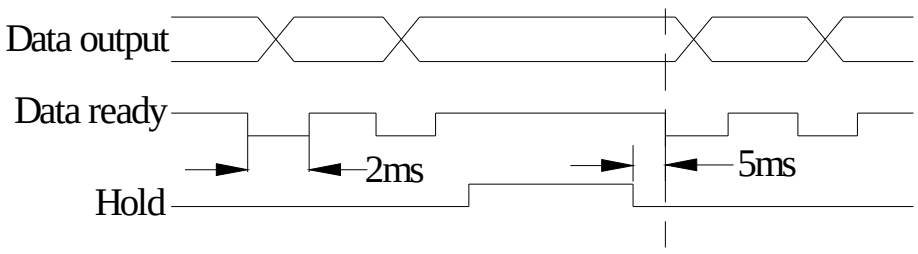


9-4-2 FUNCTION SETTING

ITEM	FUNCTION	SET VALUE		FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION	
FUNC.80	Data type	0	As displayed	0
		1	Gross	
		2	Net	
FUNC.81	Transfer mode	0	Continuous	0
		1	Auto-transfer	
		2	Manual-transfer	
FUNC.82	Output logic	0	Positive logic	0
		1	Negative logic	
FUNC.83	Data ready Signal logic	0	Positive logic	0
		1	Negative logic	

9-4-3 OUTPUT / INPUT SIGNAL DESCRIPTION

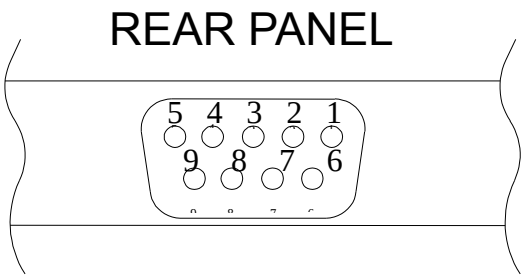
- Total of 33 output signals, use Func.82 and Func.83 to configure the output logic.
- The use of Open Collector signal outputs requires an external voltage not exceeding 30Vdc and an external resistor to limit the current to less than 30mA max.
- Connect the Hold Input to signal ground (SG) to freeze the BCD data.



9-5 Set-Point Interface

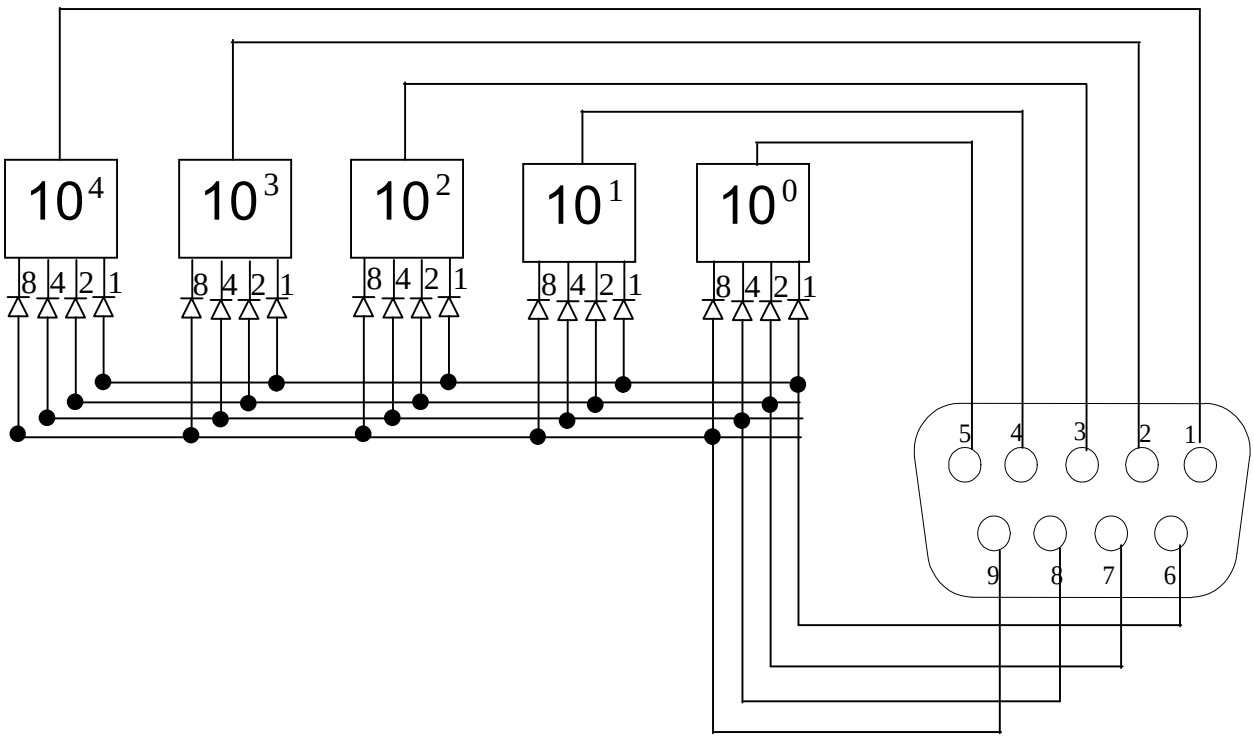
The set-point interface can be connected with the external mechanical numerical switch (BCD code) or PLC (data type set by FUNC.84). This interface transfers the received BCD code to either the Final weight (Batching, Target Weight (Checking or Preset-tare.

9-5-1 INPUT PIN ASSIGNMENT



PIN	FUNCTION
1	10^4
2	10^3
3	10^2
4	10^1
5	10^0
6	1
7	2
8	4
9	8

9-5-2 Connection method



9-5-3 Function Setting

ITEM	FUNCTION	SET VALUE		FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION	
FUNC.84	Data type	0	Not used	0
		1	Final Wt. or Target Wt.	
		2	Preset-tare	

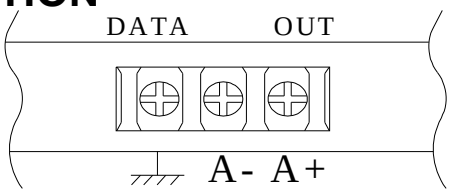
2 FOR YOUR INFORMATION

- In the Batching Mode, when the division is 10, 20, or 50, the input value will be automatically multiplied by 10.
- In the Percentage Preset-tare mode, the 10^4 function is invalid. The effective range is therefore 0~99.99%.
- When the function is activated (FUNC. 84 ≠ 0), the input value is read only by this interface and the input function via the front panel keyboard is invalid.

9-6 ANALOGUE CURRENT / VOLTAGE OUTPUT INTERFACE

This interface converts the indicator weight into current or voltage

9-6-1 TERMINAL POSITION



INTERFACE SPECIFICATION

Current output : 0 ~ 20mA
Load : 0 ~ 550Ω
Resolution : 12 bit

9-6-2 FUNCTION SETTING

ITEM	FUNCTION	SET VALUE		FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION	
FUNC.85	Data type	0	As displayed	0
		1	Gross	
		2	Net	
FUNC.86	Lower point Weight value	000000 ↓ 999999	When the weight reaches the value configured, the current output will be as set in Func.87	0
FUNC.87	Lower point Current value	0.0 mA ↓ 20.0 mA		4.0 mA
FUNC.88	Higher point Weight value	000000 ↓ 999999	When the weight reaches the value configured, the current output will be as set in Func.89	16000
FUNC.89	Higher point Current value	0.0 mA ↓ 20.0 mA		20.0 mA

9-6-3 OUTPUT SETTING DESCRIPTION

EXAMPLE 1

When 0 kg displayed output 0 mA, 100 kg displayed output 20 mA

Func.86 = 0 Func.87 = 0.0
Func.88 = 100 Func.89 = 20.0

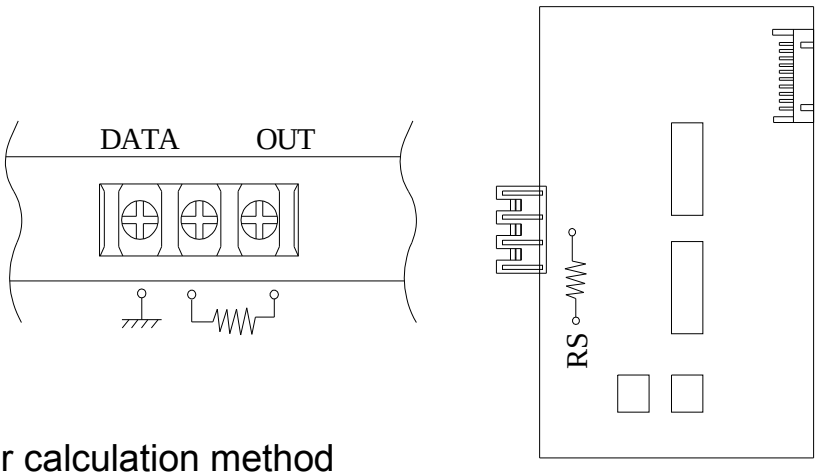
EXAMPLE 2

When 2 kg displayed output 18 mA, 900 kg displayed output 4 mA

FUNC.86 = 2 FUNC.87 = 18.0
FUNC.88 = 900 FUNC.89 = 4.0

9-6-4 VOLTAGE OUTPUT

2 If a Voltage output is required connect a resistor between the external terminals A+ & A-. Alternatively the resistor can be fitted on the interface PCB in the reserved location (RS sign) on the PCB.



2 Resistor calculation method

$$\text{Resistor value} = \frac{\text{Voltage output (max. value)}}{\text{Current output (max. value)}}$$

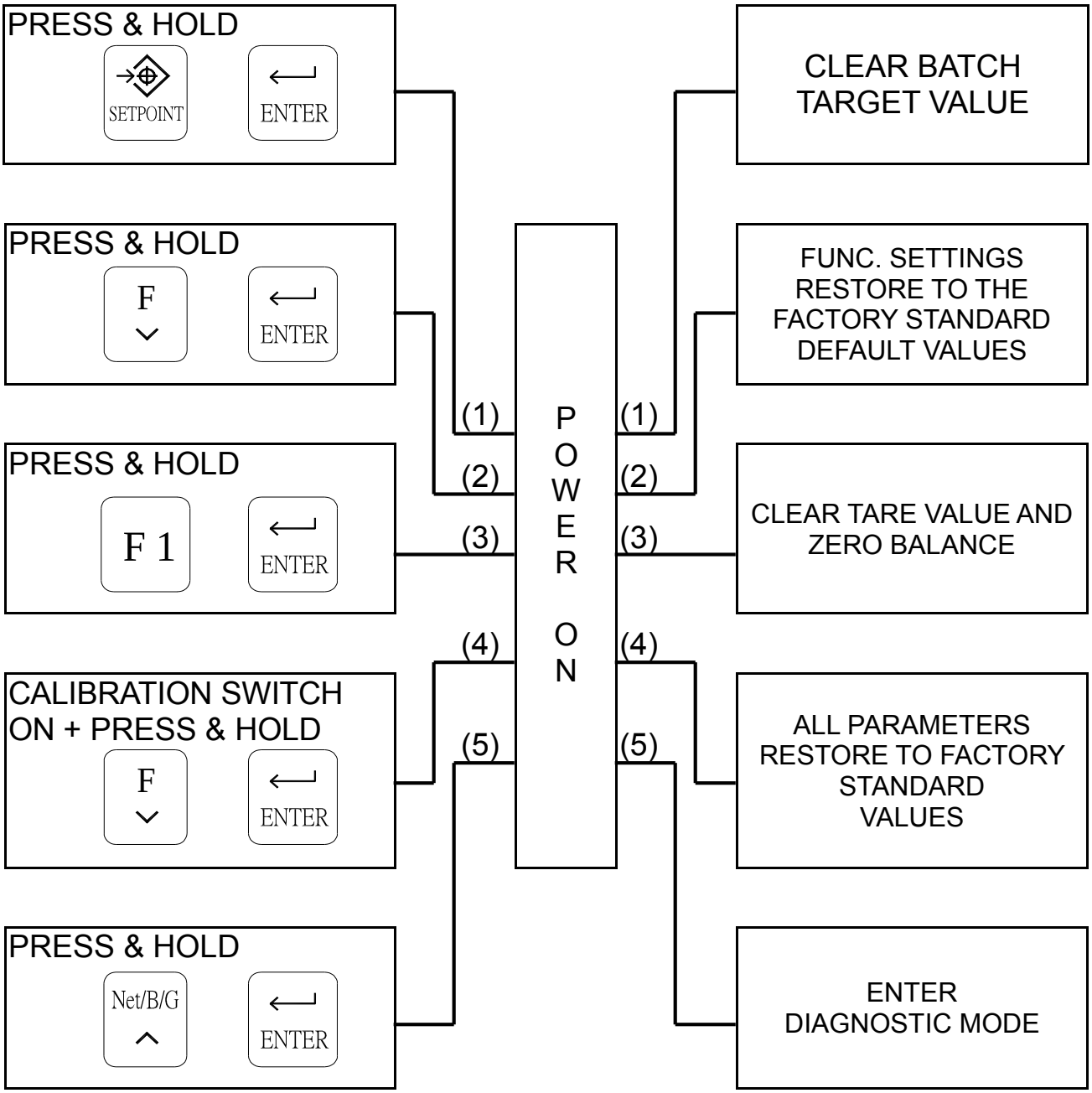
Example: If you need to convert to 0 ~10V output, the resistor value from a 0 ~ 20mA current output would be:-

$$\text{Resistor value} = \frac{10\ \text{V}}{0.02\ \text{A}} = 500\ \Omega$$

2 The resistor value must be less than 550Ω and the use of a low temperature coefficient type with a power rating of over 0.2W.

CHAPTER 10 MAINTENANCE

10-1 DATA RESTORE FUNCTION CHART



10-2 CLEAR BATCH TARGET VALUE

(1) Press and hold the SETPOINT & ENTER keys at the same time.

(2) Turn on the power.

(3) Displays show In it.SEt Point with flashing digits.

(4) Clearing the memory:-
(4-1) To confirm, press and hold ENTER key until the indicator re-sets.
(4-2) If not to abort, press the I/⏻ ESC key to quit or just switch off the indicator directly.

10-3 FUNCTION SETTINGS RESTORE TO THE FACTORY DEFAULT VALUES

(1) Press and hold the F ⌄ & ENTER keys at the same time.

(2) Turn on the power.

(3) Displays show In it.Func with flashing digits.

(4) Re-setting the defaults:-
(4-1) To confirm, press and hold ENTER key until the indicator re-sets.
(4-2) If not to abort, press the I/⏻ ESC key to quit or just switch off the indicator directly.

10-4 CLEAR TARE VALUE AND ZERO BALANCE

(1) Press and hold the F1 & ENTER keys at the same time.

(2) Turn on the power.

(3) Displays show CLr tP with flashing digits.

(4) Clearing:-
(4-1) To confirm, press and hold ENTER key until the indicator re-sets.
(4-2) If not to abort, press the I/⏻ ESC key to quit or just switch off the indicator directly.

10-5 ALL PARAMETERS RESTORE TO FACTORY STANDARD VALUES

(1) Switch on the calibration switch and press and hold keys at the same time.

(2) Turn on the power.

(3) Displays show In it.ALL with flashing digits.

(4) Restoring:-

(4-1) To confirm, press and hold ENTER key until display shows End, then switch off the calibration switch.

(4-2) To abort, switch off the calibration switch.

10-6 DIAGNOSTIC MODE

(1) Press and hold the Net/B/G & ENTER keys at the same time.

(2) Turn on the power.

(3) When displays show 1.dSP, the indicator is in the diagnostic mode.

(4) Use the Net/B/G and F keys to select the diagnostic item, press the ENTER key to enter the diagnostic routine and press the I/⏻ ESC key to quit from the selected item.

ITEM	FIGURES	DIAGNOSTIC ITEM
1	dSP	7 segment display and LED annunciators
2	KEY	Keyboard and calibration switch
3	232	RS-232 serial interface
4	E IO	Control I/O interface
5	bCd	BCD parallel interface
6	AnL	Analogue output interface
7	bAt	Memory battery
8	SP	Memory code selection interface

10-6-1 DIAGNOSTIC FOR 7 SEGMENT DISPLAY AND LED ANNUNCIATORS

7 segment displays show 0 ~ 9 , "." and the LED annunciators will light alternately.

10-6-2 DIAGNOSTIC FOR KEYBOARD AND CALIBRATION SWITCH

Switch the calibration switch "ON" or press any key and the corresponding digit on the small display will show 0 → 1 when the key is pressed.

10-6-3 DIAGNOSTIC FOR RS-232 SERIAL INTERFACE

(1) To test without a serial connection to a computer D-SUB 9 pin connector, needs pins 2 and 3 connected together. PASS is displayed when the test is successful. FAIL is displayed if the interface is not working correctly.

(2) If connected to a computer the display of 0 ~ 9 , indicates that the RS-232 output is working correctly.

10-6-4 DIAGNOSTIC FOR CONTROL I/O INTERFACE

(1) As the parallel inputs are activated their status is displayed on the 7 segment display (ON/OFF).

(2) Use Net/B/G ^ F v keys to turn on or off each relay output in turn.

10-6-5 DIAGNOSTIC FOR BCD PARALLEL OUTPUT INTERFACE

(1) The diagnostic process is active when the display shows "flashing decimal point".

(2) The program will sequentially output each of the BCD output bits. Each output will switch OFF → ON → OFF.

(3) The display will show no — IF if the interface card is not fitted.

10-6-6 DIAGNOSTIC FOR ANALOGUE OUTPUT INTERFACE

(1) Use Net/B/G ^ F v to select the output current level.

(a) AnL 4 : 4mA

(b) AnL 12 : 12mA

(c) AnL20 : 20mA

(2) The display will show no _ IF if the interface card is not fitted.

10-6-7 LOW BATTERY (Memory backup)

Healthy battery - PASS is displayed. When the battery is weak Lo is displayed and the battery should be replaced.
(Battery specification 3V, CR2032)

10-6-8 DIAGNOSTIC FOR CODE NUMBER SELECTION INTERFACE

The program displays the signals received by the interface.

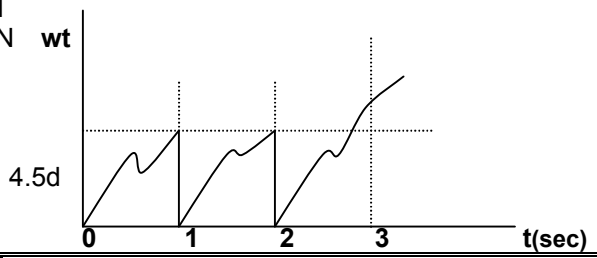
10-7 BATTERY LOW

(1) When the memory battery is low, contact your local dealer for a replacement.
(2) Battery specification 3V, CR2032

CHAPTER 11 FUNCTION LIST
11-1 BASIC FUNCTIONS

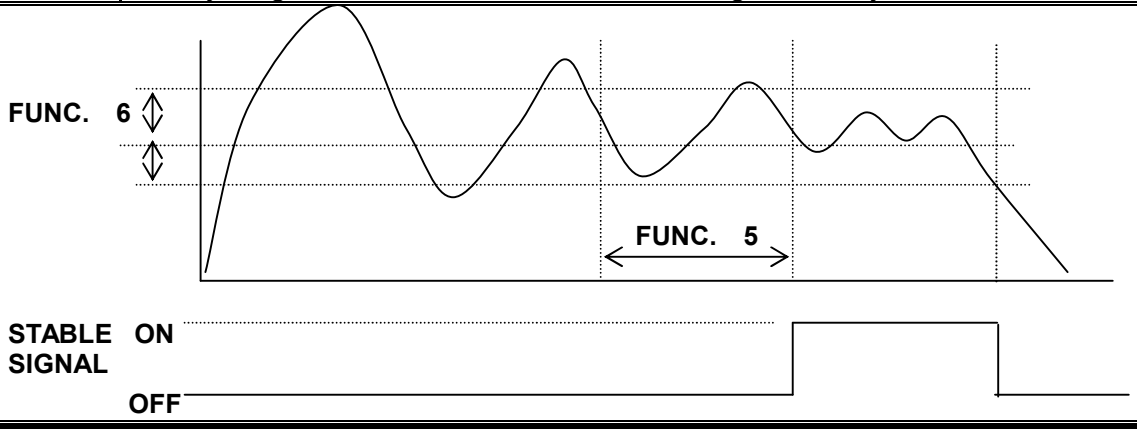
ITEM	FUNCTION	SET VALUE PARAMETER	SET VALUE DESCRIPTION	FACTORY STANDARD SET VALUE
FUNC. 0	Weight unit	0	None	1
		1	kg	
		2	t	
		3	lb	
FUNC. 1	Decimal	0	None	0
		1	0.0	
		2	0.00	
		3	0.000	
		4	0.0000	
FUNC. 2	Zero range	0 ~ 30 (±%)	Zero range = Zero calibration ± (Max. capacity × set value %)	2
FUNC. 3	Zero tracking	0.0 ~ 5.0 (sec)	Zero tracking time starts when the weight enters the zero range. When set to 0.0, the zero tracking function is disabled.	1.0
FUNC. 4	Zero tracking width	0 ~ 9	Tracking width=(set value×½)d, d=Min division. The zero tracking width is the range of weight over which the zero tracking will operate. When set to 0, the zero tracking function is disabled.	2

EXAMPLE : FUNC. 3 = 1.0 FUNC. 4 = 9



When the weight is in zero range as defined in (Func. 2), every time the zero tracking timer expires (Func. 3), if the weight is within the zero tracking width (Func. 4) but not at zero, the indicator will set the weight back to the zero point.

FUNC. 5	Weigher steady time	0.0 ~ 5.0 (sec)	Weigher steady time. The weight must be within the weigher steady range for this time before the steady signal is given. When set to 0.0, the weigher steady is disabled.	1.0
FUNC. 6	Weigher steady range	0 ~ 9	Weigher steady range in divisions. When set 0, the weigher steady is disabled.	2



ITEM	FUNCTION	SET VALUE				FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION			
FUNC. 7	Tare and Zero when the weight is unstable	0	OFF			1
		1	ON			
FUNC. 8	Tare at negative gross	0	OFF			1
		1	ON			
FUNC. 9	Digital filter	0 ~ 49	Greater the value the greater the filtering. When set to 0, the digital filter function is off.			25
FUNC.10	Inhibit front panel keys	00000000 ↓ 11111111	0	OFF	The order of the bits and front panel key positions are related to each other	00000000
			1	ON		
FUNC.11	Display update rate	0	20 Times/sec.			0
		1	10 Times/sec.			
		2	5 Times/sec.			
FUNC.12	Contents of Sub-display section	0	None			0
		1	Gross			
		2	Net			
		3	Tare			
		4	Batch codes and Final value			
		5	Totalised weight			
		6	Number of transactions in the total			
		7	Totalised weight / Number of transactions in the total			
		8	Quantity / Unit weight			
		9	Preset-tare weight			

ITEM	FUNCTION	SET VALUE		FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION	
FUNC.13	"F" key function	**Parameter Þ Description** 0 ⇒ None 1 ⇒ Manually output the parallel and serial data 2 ⇒ Clear Tare 3 ⇒ Start Batch 4 ⇒ Stop Batch 5 ⇒ Add current Net weight to the totaliser and increment transactions counter 6 ⇒ Delete previous totalised weight and subtract one from the transaction counter 7 ⇒ Toggle between display of the totalised weight or the transaction counter 8 ⇒ Clear totalised weight and transaction counter to zero 9 ⇒ Hold ON/OFF 10⇒ Switch the display of Unit Weight and Quantity 11⇒ Unit Weight Input or Quantity Sampling 12⇒ Preset-tare input 13⇒ Preset-tare ON/OFF		0
FUNC.14	"F1" key function			
FUNC.15	Hold	0	No hold	0
		1	Peak hold (a positive value)	
		2	Peak hold (absolute value)	
FUNC.16	Preset-tare	0	Preset-tare gross weight	0
		1	Preset-tare percentage	

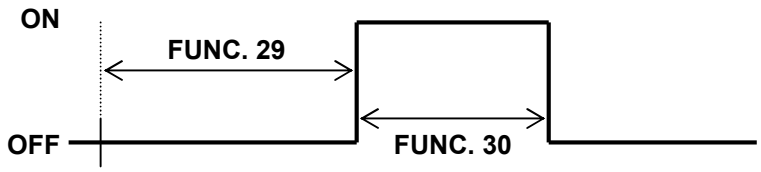
11-2 WEIGHING FUNCTIONS

ITEM	FUNCTION	SET VALUE		FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION	
FUNC.19	Weight Comparison	0	Weight Comparison	0
		1	Quantity Comparison	
FUNC.20	Weighing mode	0	Normal batch	0
		1	Loss-in-weight	
		2	Normal batch (Built-in program)	
		3	Loss-in-weight (Built-in program)	
		4	Check weighing 1	
		5	Check weighing 2	
		6	Check weighing 3	
		7	Check weighing 4	
FUNC.21	Batch start delay time	0.0 ~ 25.5 (sec)	The built-in auto-program normally starts the batch comparison procedure after the input of the batch start signal (leading edge). If FUNC.21 is > 0 then the batch is started after the timer expires (effectively trailing edge)	0.0
FUNC.22	Batch time Monitoring	0 ~ 255 (sec)	The batch time monitoring starts after batch weighing is started. The batch time output signal is switched off when the timer has expired. This count down timer can be used to monitor the speed of the batching process to highlight problems with material feed and other process variables etc.	0
FUNC.23	SP1 Trip comparison delay time	0.0 ~ 25.5 (sec)	The full flow trip point is not checked during the period this timer is active. Used to effectively de-bounce the comparison between the live weight and the trip point. If set to zero the de-bounce function is inhibited.	0.0
FUNC.24	SP2 Trip comparison delay time	0.0 ~ 25.5 (sec)	The medium flow trip point is not checked during the period this timer is active. Used to effectively de-bounce the comparison between the live weight and the trip point. If set to zero the de-bounce function is inhibited.	0.0

ITEM	FUNCTION	SET VALUE		FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION	
FUNC.25	F.FALL Trip comparison delay time	0.0 ~ 25.5 (sec)	The dribble flow trip point is not checked during the period this timer is active. Used to effectively de-bounce the comparison between the live weight and the trip point. If set to zero the de-bounce function is inhibited.	0.0
FUNC.26	Auto in-flight compensation	0	OFF	0
		1	ON	
FUNC.27	Auto in-flight compensation active window weight (Enabled by setting Func.26 to ON)	0 ~999999kg	If the final settled weight is outside of the target weight ± this active window value, then this settled weight is ignored for the purposes of in-flight compensation. This caters for unusual circumstances such as external weight interference or random errors in product feed (lumpy / sticky).	0
FUNC.28	Batch finish signal	0	Do not wait until the weight has stabilized	1
		1	Wait until the weight has stabilized.	
FUNC.29	Batch finish output signal delay time	0.0 ~ 25.5 (sec)	Output the batch finish signal after the delay time.	0.5

ITEM	FUNCTION	SET VALUE		FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION	
FUNC.30	Batch finish output signal time	0.0 ~ 25.5 (sec)	Batch finish output signal on time. If set to 0, the output signal will remain off until the next batch is started.	0.5

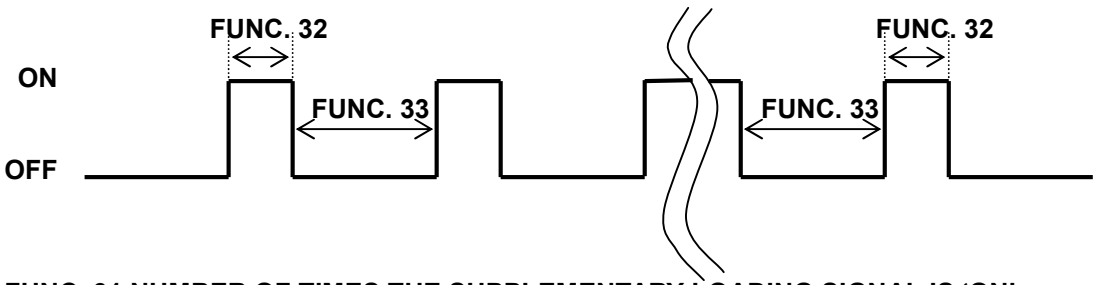
BATCH FINISH SIGNAL



BATCH FINISH

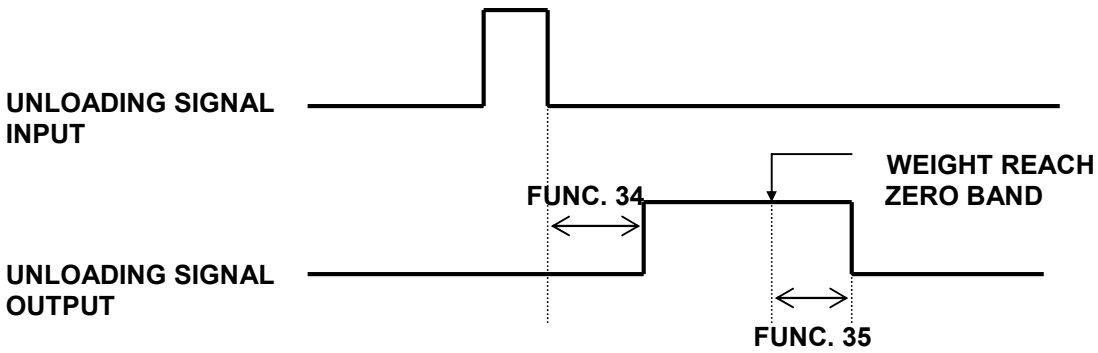
FUNC.31	Number of supplementary loading cycles	0 ~ 255	If the set to 0, this function is disabled.	0
FUNC.32	Supplementary loading gate open time	0.01 ~ 2.55 (Sec)	The time the supplementary loading signal is switched on for. (Func.31)	0.1
FUNC.33	Supplementary loading gate close time	0.1 ~ 25.5 (Sec)	The time the supplementary loading signal is switched off for. (Func.31)	1.0

SUPPLEMENTARY LOADING SIGNAL



FUNC. 31 NUMBER OF TIMES THE SUPPLEMENTARY LOADING SIGNAL IS 'ON'

ITEM	FUNCTION	SET VALUE		FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION	
FUNC.34	Unloading start delay time	0.0 ~ 25.5 (Sec)	Delay before the Unloading signal is switched ON	0.0
FUNC.35	Unloading stop delay time	0.0 ~ 25.5 (Sec)	Delay before the Unloading signal is switched OFF	0.0
FUNC.36	Max. unloading time	0 ~ 255 (Sec)	Will not activate the internal unloading control function, If set to 0.	0



FUNC.37	Under and Over	0	Compare at any weighing moment	0
		1	Compare after final batch	
FUNC.38	Include the zero band into the final Batch value (unloading only)	0	Not included	0
		1	Included	
FUNC.39	Auto-totalisation of weighings and weight	0	OFF	0
		1	ON	

Note :

1. **FUNC. 21 ~ FUNC. 37 used with the built-in program for loading and unloading batching. FUNC. 20 set in modes 2 & 3.**
2. **FUNC. 38 can only be used with the built-in program for unloading batching. FUNC. 20 set in mode 3.**

11-3 EXTERNAL CONTROL OUTPUT SIGNALS

ITEM	FUNCTION	SET VALUE PARAMETER - DESCRIPTION	FACTORY STANDARD SET VALUE
FUNC.41	Input 1	0 = Not in use 1 = Zero 2 = Tare 3 = Clear Tare 4 = Batch Start 5 = Batch Stop 6 = Unloading Start 7 = Print serial and parallel output information manually 8 = Totalising command Totalise current net weight and increments the number of weighings 9 = Cancel Total Delete previous totalised weight and subtracts one from the number of weighings 10 = Clear Total Clear totalisers back to zero	1
FUNC.42	Input 2		2
FUNC.43	Input 3		3
FUNC.44	Input 4		4
FUNC.45	Input 5		5
FUNC.46	Input 6		6

11-4 RELAY OUTPUTS

<table>
<tr><th rowspan="2">ITEM</th><th rowspan="2">FUNCTION</th><th colspan="4">SET VALUE</th><th rowspan="2">FACTORY STANDARD SET VALUE</th></tr>
<tr><th>PARAMETER</th><th colspan="3">DESCRIPTION</th></tr>
<tr><td>FUNC.50</td><td>Output Connection mode</td><td>00000000
↓
11111111</td><td>0</td><td>Normally Open (connection A)</td><td rowspan="2">The bits and output point position are related to each other</td><td>00000000</td></tr>
<tr><td></td><td></td><td>1</td><td>Normally Closed (connection B)</td><td></td><td></td></tr>
<tr><td>FUNC.51</td><td>Output 1</td><td colspan="4" rowspan="8">PARAMETER Þ DESCRIPTION

0 ⇒ Not in use
1 ⇒ Zero Band
2 ⇒ Under / Hi - Hi
3 ⇒ Over / Hi
4 ⇒ SP1 / Go
5 ⇒ SP2 / Lo
6 ⇒ Free Fall / Lo - Lo
7 ⇒ Unloading
8 ⇒ Batch Finish
9 ⇒ Stable
10 ⇒ Running (built-in program in weighing process)
11 ⇒ Error (built-in program incorrect weighing)
12 ⇒ External Input signal acknowledge
13 ⇒ Weighing Capacity Overflow
14 ⇒ Battery Low</td><td>1</td></tr>
<tr><td>FUNC.52</td><td>Output 2</td><td>2</td></tr>
<tr><td>FUNC.53</td><td>Output 3</td><td>3</td></tr>
<tr><td>FUNC.54</td><td>Output 4</td><td>4</td></tr>
<tr><td>FUNC.55</td><td>Output 5</td><td>5</td></tr>
<tr><td>FUNC.56</td><td>Output 6</td><td>6</td></tr>
<tr><td>FUNC.57</td><td>Output 7</td><td>7</td></tr>
<tr><td>FUNC.58</td><td>Output 8</td><td>8</td></tr>
</table>

11-5 RS-232 & CURRENT LOOP FUNCTIONS

ITEM	FUNCTION	SET VALUE			FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION		
FUNC.60	Data type	0	As displayed		0
		1	Gross		
		2	Net		
		3	Tare		
		4	Gross / Net / Tare		
		5	Totalised Weight		
		6	Total Number of weighings		
		7	Totalised Weight and Number of weighings		
FUNC.61	Transfer mode	0	Continuous		0
		1	Auto-transmit		
		2	Manual-transmit		
		3	Command mode		
		4	Fast mode Comparison condition + Gross weight		
		5	Fast mode Comparison condition + Net weight		
FUNC.62	BAUD rate	0	1200		1
		1	2400		
		2	4800		
		3	9600		
		4	19200		
		5	38400		
FUNC.63	Parity bit Data Bits Stop bits	0	N, 8, 1	No parity, 8 data bits, 1 stop bit.	2
		1	O, 7, 1	Odd parity, 7 data bits, 1 stop bit.	
		2	E, 7, 1	Even parity, 7 data bits, 1 stop bit.	
FUNC.64	Finish character	0	CR		1
		1	CR + LF		
FUNC.65	Unstable or Over max. capacity	0	Normal data transmission		0
		1	Inhibit data transmission		

11-6 RS-422 / RS-485 INTERFACES FUNCTIONS

ITEM	FUNCTION	SET VALUE			FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION		
FUNC.70	Location	0	Addresses not in use		0
		01 ~ 99	Indicator address		
FUNC.71	Data type	0	As displayed		0
		1	Gross		
		2	Net		
		3	Tare		
		4	Gross / Net / Tare		
		5	Totalised weight		
		6	Number of weighings		
		7	Totalised Weight and Number of weighings		
FUNC.72	Transfer mode	0	Continuous		3
		1	Auto-transmit		
		2	Manual-transmit		
		3	Command mode		
		4	Fast mode Comparison condition + gross wt.		
		5	Fast mode Comparison condition + net weight		
FUNC.73	BAUD rate	0	1200		1
		1	2400		
		2	4800		
		3	9600		
		4	19200		
FUNC.74	Parity bit Data Bits Stop bits	0	N, 8, 1	No parity, 8 data bits, 1 stop bit.	2
		1	O, 7, 1	Odd parity, 7 data bits, 1 stop bit.	
		2	E, 7, 1	Even parity, 7 data bits, 1 stop bit.	
FUNC.75	Finish character	0	CR		1
		1	CR + LF		
FUNC.76	Unstable or Over max. capacity	0	Normal data transmission		0
		1	Inhibit data transmission		

11-7 BCD OUTPUT INTERFACES FUNCTIONS

ITEM	FUNCTION	SET VALUE		FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION	
FUNC.80	Data type	0	As displayed	0
		1	Gross	
		2	Net	
FUNC.81	Transfer mode	0	Continuous	0
		1	Auto-transfer	
		2	Manual-transfer	
FUNC.82	Output logic	0	Positive logic	0
		1	Negative logic	
FUNC.83	Data ready Signal logic	0	Positive logic	0
		1	Negative logic	

11-8 SET-POINT INTERFACE FUNCTION

ITEM	FUNCTION	SET VALUE		FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION	
FUNC.84	Data type	0	Not used	0
		1	Final Wt. or Target Wt.	
		2	Preset-tare	

11-9 ANALOGUE OUTPUT INTERFACE FUNCTIONS

ITEM	FUNCTION	SET VALUE		FACTORY STANDARD SET VALUE
		PARAMETER	DESCRIPTION	
FUNC.85	Data type	0	As displayed	0
		1	Gross	
		2	Net	
FUNC.86	Lower point Weight value	000000 ↓ 999999	When the weight reaches the value configured, the current output will be as set in Func.87	0
FUNC.87	Lower point Current value	0.0 mA ↓ 20.0 mA		4.0 mA
FUNC.88	Higher point Weight value	000000 ↓ 999999	When the weight reaches the value configured, the current output will be as set in Func.89	16000
FUNC.89	Higher point Current value	0.0 mA ↓ 20.0 mA		20.0 mA

--END--