Mise A ZERO : (AVEC TARE MORTE)

LOCK ⇨

FAIRE E1 ou E2 ←

"01 CSP"

TOUCHE 4

"02 CAL"

TOUCHE ENTER

"ZERO"

0 0 0 0

10 secondes

"SPAN"

LOCK ⇨

"END"

→ L'INDICATEUR REDEMARRE ET IL EST A ZERO.

0.000 kg

DP 100

User Manual

Table of Contents

Version March 2011
Software version 3075 or higher

SAFETY PRECAUTIONS

WARNING-SHOCK HAZARD
Due to the risk of electrical shock, this instrument must be installed only by qualified personnel.

WARNING- SHOCK HAZARD
Due to the risk of electrical shock, the cover must be removed only by qualified personnel.

WARNING
No ground or incorrect ground connection might cause electric shocks and/or breakdowns.

CAUTION
Calibration and configuration must be performed only by qualified personnel.

CAUTION
Turn off power before installing or disassembling.

CAUTION
The integrated circuits in the DP 100 are sensitive to electrostatic discharge (ESD). Be sure to follow proper procedures for transporting, storing and handling ESD sensitive components.

CAUTION
Never use alcohol or solvents to clean the indicator. These chemical products could damage it.
Make sure that water does not enter the indicator. It could damage electronic components.

1 Keypad Instruction

Function	Operation	Description
General Function Setting	Press and hold [ENTER], and then press [F1/▲]	Refer to section **5** for details.
Weighing Parameter Setting	Adjust calibration switch to ON	Refer to section **6.1** for details.
Calibration	Adjust calibration switch to ON	Refer to section **6.2** for details.
Default Recovery for All Parameters	Adjust calibration switch to ON, and then press and hold [F1/▲] [ENTER]	Refer to section **9.1** for details.
Default Recovery for General Function Parameters	While turning on with countdown, press and hold [F1/▲] [ENTER]	Refer to section **9.2** for details.
Self-diagnosis Mode	While turning on with countdown, press and hold [ZERO]	Refer to section **9.3** for details.

2 Specifications

Analog Specification

- Load Cell Current : 5 V DC ±5% 60 mA (Up to four 350 Ω Load Cells)
- Max. Load Cell Input Signal : 3 mV/V
- Input Sensitivity : 0.15 μV/d or more
- Conversion Rate : 120 times/s (max.)
- Resolution : 20 bits

Digital Specification

- Display : LCD, 6 digits, 25.4 x 10 mm (W x H), LED backlight
- Display Frequency : 50 times/s (max)
- Display Range : - 999 999 ~ 999 999
- Min. Division : 1, 2, 5, 10, 20, 50
- Decimal Point : 0, 0.0, 0.00, 0.000, 0.0000
- Memory : Calibration parameter and function setting are all stored in EEPROM.

Serial Interface

- RS-232 port for PC or printer connection

Power Requirement

- Adaptor Spec. : Input 230 V AC 50 ~ 60 Hz
  Output 9 V DC / 1000 mA
- Batteries : General AA batteries (5 pcs)
- Max. Power Consumption : 110 mA (with 4 load Cells + backlight + RS-232 interface)

Others

- Operation Temperature : 0 ~ 40 °C
- Operation Humidity : < 85% R.H.
- Dimensions (W × D × H) (mm) : 193 × 49.5 × 84.4 (Indicator housing)
  225 × 60 × 134.7 (mounting hardware included)
- Weight : 1500 g

3 Front and Rear Panels

3.1 *Front Panel*

Indication:

TARE : Tare mode
MOTION : Unstable weighing indication
M+ : Accumulation mode indication
GROSS : Gross weight
PT : Manual tare
RANGE1/HOLD : Dual-range resolution indication: range 1/ HOLD indication
RANGE2 : Dual-range resolution indication: range 2

RANGE1 and HOLD description:
The led is ON by default. When using CNF-05 function (animal scale mode) or FNC-03 function (HOLD function setting) it works as a hold led. In the other hand when using the multi-range mode, this led is used to indicate the range situation where we are.
CFN-05 (animal scale mode) and FNC-03(HOLD function setting) functions can not work at the same time.

Keypad:

ESC — 1) Power ON / OFF. Press and hold this key for 3 seconds to shut down.
2) Abort or exit when setting.

ZERO — 1) Weight re-zero.
2) Increase the flashing value by one when setting.

TARE — 1) Eliminate the gross weight.
2) Decrease the flashing value by one when setting.

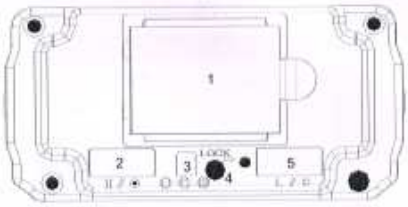
GROSS/NET — 1) Switch Gross / Net weight shown on display.
2) Move the cursor leftward when setting.

F2 — 1) Keypad function (FNC-02 & FNC-03).
2) Move the cursor rightward when setting.

F1/▲ — Keypad function (FNC-02 & FNC-03).

ENTER — Confirm key.

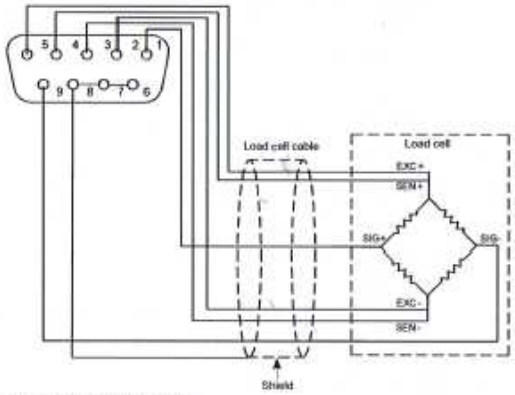
3.2 *Rear Panel*



1. Battery Case
2. RS-232 Plug
3. 9 V DC Power Input
4. Calibration Switch
5. Load Cell Connect Socket

4 Installation

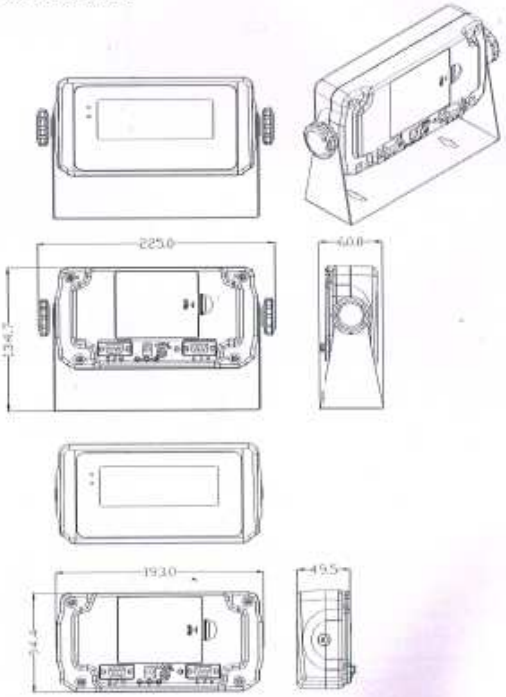
4.1 *Load Cell*



The indicator connector is a SUB-D 9 Male.

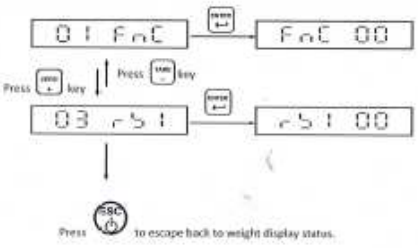
SUB-D 9 Connector Aerial female	4-Wire Load Cell		6-Wire Load Cell	
	PIN	SIGNAL	PIN	SIGNAL
	1	SIG +	1	SIG +
	2-3	EXC-	2	EXC-
	4-5	EXC+	3	SEN-
	6-7-8	SHIELD	4	SEN+
Pin Assignment View from welded side	9	SIG-	5	EXC+
	Bridge pins 2-3 (EXC- and SENSE-), 4-5 (EXC- and SENSE+) and 6-7-8 (SHIELD)		6-7-8	SHIELD
			9	SIG-
			Bridge pins 6-7-8 (SHIELD)	

4.2 *Dimensions*



5 External Function Parameter Setting

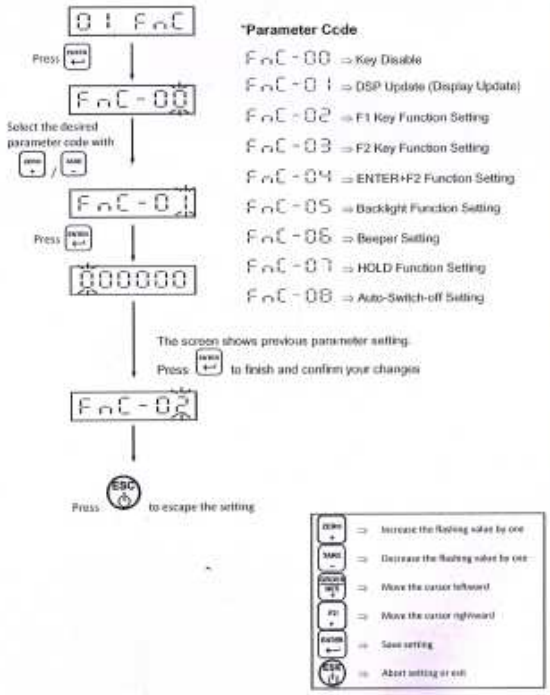
Under general weight display status, press [ENTER] [F1/⌫], and the screen will show:



01 FnC ⇒ External function setting

03 rS1 ⇒ RS-232 interface function

5.1 01 FnC *External Function Setting*

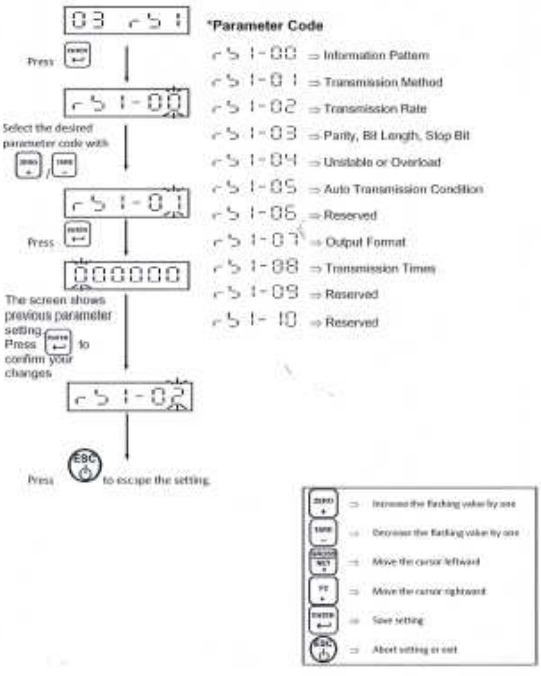


External Function Parameter Setting

Parameter Code	Function	Setting Value: Parameter	Setting Value: Description	Default Setting
FNC-00	Key disable	0000 ↓ 1111	0 ON / 1 OFF — 0000 is corresponding to (from left to right):	0000
FNC-01	DSP Update	0	No Limit	1
		1	20 times/s	
		2	10 times/s	
		3	5 times/s	
		4	1 times/s	
FNC-02	F1 Key Function Setting	0	Print (printing)	5
		1	Units (units switch)	
		2	M+ (accumulation and printing)	
		3	MC (memory clearing)	
		4	Weight / Weight Accumulation / Time Accumulation Display Switch	
		5	HR (high-resolution switch)	
		6	Manual tare (Manual tare function)	
FNC-03	F2 Key Function Setting	0	Print (printing)	1
		1	Units (units switch)	
		2	M+ (accumulation and printing)	
		3	MC (memory clearing)	
		4	Weight / Weight Accumulation / Time Accumulation Display Switch	
		5	HR (high-resolution switch)	
		6	Manual tare (Manual tare function)	
FNC-04	ENTER+F2 Function Setting	0	Print (printing)	0
		1	Units (units switch)	
		2	M+ (accumulation and printing)	
		3	MC (memory clearing)	
		4	Weight / Weight Accumulation / Time Accumulation Display Switch	
		5	Resolution Conversion	
		6	Manual tare (Manual tare function)	
FNC-05	Backlight Setting	0	Auto Backlight On (backlight on in operation only)	1
		1	Backlight On (backlight always on)	
		2	Backlight Off	
FNC-06	Beeper Setting	0	Beeper off	1
		1	Beeper on	

FNC-07	HOLD function setting	0	Disabled function	0
		1	Mode 1	
		2	Mode 2	
FNC-08	Auto Switch-off (minutes)	0	Disabled function	0
		1 ~ 60	It works in a stable weight and no key pressed	

5.2 03 rS1 *RS-232 Setting*



RS-232 Interface Function

Parameter Code	Function	Setting Value			Default Setting
		Parameter	Description		
RS1-00	Information Pattern (Please refer to page 16)	0	Display Correspondingly		0
		1	Gross Weight		
		2	Net Weight		
		3	Tare		
		4	Accumulated Weight		
		5	Numbers of accumulations		
		6	Ticket		
		7	PT output		
RS1-01	Transmission Method	0	Continuous Transmission		0
		1	Auto Transmission		
		2	Press [TARE] or [PRINT] to transmit		
		3	Command Mode (no address)		
		4	Reserved		
RS1-02	Transmission Rate	0	1200		3
		1	2400		
		2	4800		
		3	9600		
RS1-03	Parity, Bit Length, Stop Bit	0	N - 8 - 1	No Parity, 8 Bits Length, 1 Stop Bit	0
		1	O - 7 - 1	Odd Parity, 7 Bits Length, 1 Stop Bit	
		2	E - 7 - 1	Even Parity, 7 Bits Length, 1 Stop Bit	
RS1-04	Unstable or Over Load	0	Continue Output		0
		1	Stop Output		
RS1-05	Auto Transmission Condition	0	Positive (over > 100)		0
		1	Positive / Negative (over > 100, under < -100)		
RS1-06	Reserved	Reserved	Reserved		Reserved
RS1-07	Output Format	0	Standard Format		0
		1	UMC 600		
		2, 3, 4, 5, 6	Reserved		
RS1-08	Transmission Times	0	No Limit		4
		1	1 times/s		
		2	2 times/s		
		3	5 times/s		
		4	10 times/s		
		5	20 times/s		

RS1-09	Reserved	Reserved	Reserved	Reserved
RS1-10	Reserved	Reserved	Reserved	Reserved

Transmission Format

RS1-00 ⇨ 0 ~ 3

S	T	,	G	S	,	+	1	2	3	4	.	5	6		g	CR	LF
Header 1			Header 2			Weight Data (6 digits)								Unit		Terminators	

Header 1
ST: Stable Weight / US: Unstable Weight / OL: Weight Overload

Header 2
GS: Gross Weight / NT: Net Weight / TR: Tare

Weight Data (6 digits)
The first digit of weight data represents "+ / -" indication for weight value. The other 7 digits, including decimal point, represent the weight value. If the weight is over load (Header 3: OL), the screen turns into "blank" except "+ / -" indication and decimal point.

Unit
kg, lb, t or "blank"

Terminators
CR and LF are data termination code.

RS1-00 = 4

T	N	,	1	2	3	CR	LF

RS1-00 = 5

T	W	,	+	1	2	3	4	.	5	6	k	g	CR	LF

RS1-00 = 6

D	A	T	E		:	2	0	X	X	/	X	X	/	X	X	CR	LF
T	I	M	E		:	X	X	:	X	X	:	X	X	CR	LF		
G	R	O	S	S	:	+	1	2	3	4	.	5	6	k	g	CR	LF
N	E	T			:	+	1	2	3	4	.	5	6	k	g	CR	LF
T	A	R	E		:	+	1	2	3	4	.	5	6	k	g	CR	LF
T	N				:	X	X	X	CR	LF							
T	W				:	+	1	2	3	4	.	5	6	k	g	CR	LF

RS1-00 = 7

D	A	T	E		:	2	0	X	X	/	X	X	/	X	X	CR	LF
T	I	M	E		:	X	X	:	X	X	:	X	X	CR	LF		
G	R	O	S	S	:	+	1	2	3	4	.	5	6	k	g	CR	LF
N	E	T			:	+	1	2	3	4	.	5	6	k	g	CR	LF
T	A	R	E		:	+	1	2	3	4	.	5	6	k	g	CR	LF
P	T				:	+	1	2	3	4	.	5	6	k	g	CR	LF
T	N				:	X	X	X	CR	LF							
T	W				:	+	1	2	3	4	.	5	6	k	g	CR	LF

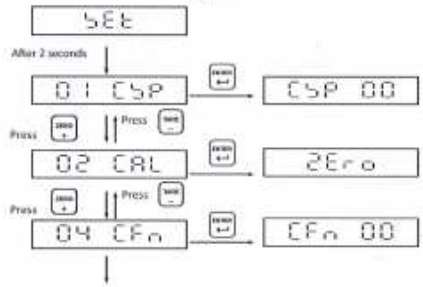
Command Mode

Command	Function	Command	Function
READ / RW	Weight Reading	CT	Tare Clearing
ZERO / MZ	Weight Re-zeroing	RT	Weight Accumulation
TARE / MT	Gross Weight Deducting	RN	Times Accumulation
NTGS	Gross / Net Switch	AT	Weight and Times Accumulation
MG	Gross Weight Indicating	DT	Weight and Times Accumulation Clearing
MN	Net Weight Indicating		

❶ After setting the commands mentioned above, it's necessary to add the termination code "CR (0DH) and LF (0AH)".
❷ If the command is not correct, it will reply "E" + "Command Unidentified".

6 Internal Calibration

Adjust calibration switch to "ON". The screen displays:



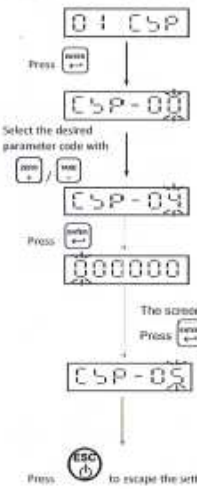
Adjust calibration switch back to "LOCK".

01 CSP ⇒ Scale definition

02 CAL ⇒ Weight Calibration

04 CFn ⇒ Internal Function Setting

6.1 01 CSP *Scale definition*



***Parameter Code**

CSP-00 ⇒ Decimal Point

CSP-01 ⇒ Maximum Weighing Capacity

CSP-02 ⇒ Division 1

CSP-03 ⇒ Division 2

CSP-04 ⇒ Zero Tracking Setting

CSP-05 ⇒ Unstable Detection Setting

The screen shows previous parameter setting.

Press [ENTER] to finish with your changes

CSP-05

Press [ESC] to escape the setting

[ZERO]	⇒ Increase the flashing value by one
[TARE]	⇒ Decrease the flashing value by one
[GROSS/NET]	⇒ Move the cursor leftward
[F1]	⇒ Move the cursor rightward
[ENTER]	⇒ Save setting
[ESC]	⇒ Abort setting or exit

Specification Parameter Description

Parameter Code	Function	Setting Value		Default Setting
		Parameter	Description	
CSP-00	Decimal Point		Refer to the description on next page	0
CSP-01	Maximum Weighing Capacity	999 999 ↓ 000 000	Max. value for weight display	999 999
CSP-02	Division 1	1 2 5 10 20 50	Division for range 1	1
CSP-03	Division 2	1 2 5 10 20 50	Division for range 2	1
CSP-04	Zero Tracking Setting		Refer to description on next page	0.25d/sec
CSP-05	Unstable Detection Setting		Refer to description on next page	0.25d/sec

Parameter Display Description

CSP-00 Decimal Point

Display	Decimal Point Digit
d 0	None
d 00	1 digit
d 000	2 digits
d 0000	3 digits
d 00000	4 digits

CSP-04 Zero Tracking Setting

Display	Division/Time
0.25 d	0.25 d / 1 s
0.5 d	0.5 d / 1 s
0.75 d	0.75 d / 1 s
1 d	1d / 1 s
1.25 d	1.25 d / 2 s
1.5 d	1.5 d / 2 s
1.75 d	1.75 d / 2 s
2 d	2 d / 2 s
no	No Zero Tracking

CSP-05 Unstable Detection Setting

Display	Division / Time
0.25 d	0.25 d / 1 s
0.5 d	0.5 d / 1 s
0.75 d	0.75 d / 1 s
1 d	1d / 1 s
1.25 d	1.25 d / 2 s
1.5 d	1.5 d / 2 s
1.75 d	1.75 d / 2 s
2 d	2 d / 2 s
no	No Unstable Detection

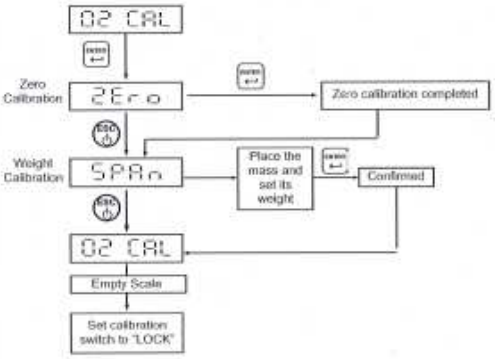
6.2 02 CAL *Weight Calibration*

Turn on and warm up the indicator for 15 to 30 minutes before calibration.

Adjust the calibration switch to "ON". The screen will show SEt

Press [TARE -] or [ZERO +] to select 02 CAL

Procedure



Zero Calibration

a) Ensure there is nothing on the platform; after being stable, press [ENTER], the screen will display "------". The zero calibration will be completed 5 seconds later.

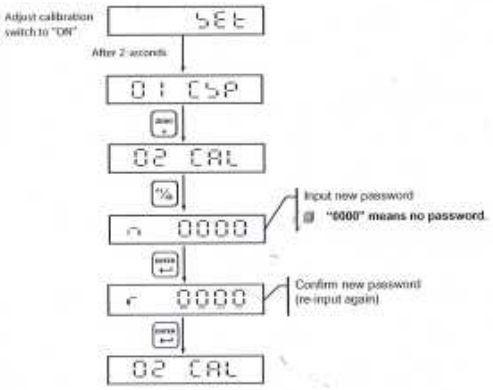
b) To abort zero calibration, just press [ESC].

Weight Calibration

a) Place an object with a known weight on the platform. Input the weight value from front panel. After being stable, press [ENTER]. The screen will show "------". The weight calibration will be completed 5 seconds later.

b) To abort weight calibration, just press [ESC].

6.3 *Password Setting*



Once password setting is completed, when entering to calibration mode or function setting mode, the screen shows PSW for 1 second, and then 0000. Then it is necessary to input the password correctly to access these modes.

If the input password is not correct, the screen will show Err.

WARNING

Keep this number in a safe place. This will be the only one that will let you access calibration mode or function setting mode

6.5 *Error Messages*

(1)	Err 0	Load Cell or A/D circuit is not working properly
(2)	Err 2	Weighing value is lower or equal to zero
(3)	Err 6	Internal resolution is lower than 0.15 μV/d range
(4)	Err.	Incorrect password
(5)	E 1	Weight is higher than zero range
(6)	E 2	Weight value is lower than zero range

7 Special Function

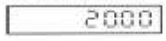
7.1 *Animal Scale Setting*

CFN-05 = 1

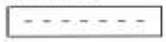
(Animal Scale Mode1: No weight is displayed under unstable status)

When there is nothing on the platform, the screen shows:

When an object is on the platform, taking an object of 20 g as an example, the screen shows:



If the display weight value keeps being lower than zero plus 10d or press Enter key to start weighing, then the screen shows:



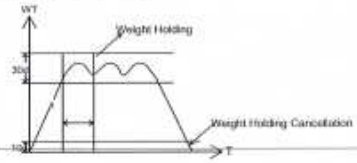
CFN-05 = 2

(Animal Scale Mode 2: Weight is displayed both under unstable or stable status)

When the weight value reaches the range of CFN-06 and CFN-07 setting, the screen will keep showing the weight value.

When the weight value is over the range of CFN-06 and CFN-07 setting, the screen will show the normal weight measurement.

For example: CFN-06=30 CFN-07=2

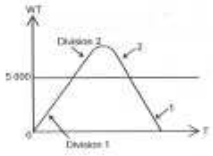


7.2 *Dual Range Resolution Switch Function*

If the setting of CSP-02 is not the same as CSP-03, the dual range resolution will be available.

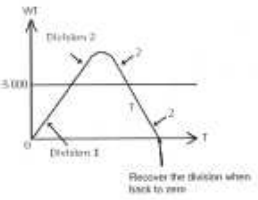
CFN-08 = 0 Multi - interval

If CFN-09 = 5 000



CFN-08 = 1 Multi - range

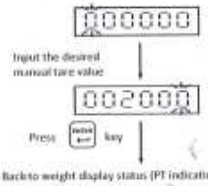
If CFN-09 = 5 000



7.3 *Manual tare function*

FNC-02, FNC-03 or FNC-04 setting is at parameter 6. (Manual tare function)

Under weight display status, press [F1/▲] or [F2/▼] key (according to FNC setting), the screen will show:



Manual tare cancellation

When the gross weight volume shows "0", press [TARE] key to cancel the manual tare value.

7.4 *Resolution Switch Function*

FNC-02, FNC-03 or FNC-04 setting is at parameter 5.

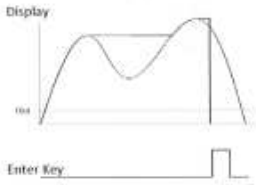
Under weight display status, press [F1/▲] or [F2/▼] key (according to FNC setting), the screen will show 10 times resolution and recover the original resolution after 5 seconds.

7.5 *Peak value function- HOLD*

Mode 1

The RS-232 port gets into transmission the HOLD value automatically when the weight is higher than 10d; the indicator keeps the maximum weight value. By pressing the [ENTER] key you will unlock the HOLD mode.

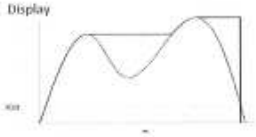
The RS-232 port sends the PEAK value stored in HOLD when pressing the [ENTER] key.



Mode 2

The RS-232 port gets into transmission the HOLD value automatically when the weight is higher than 10d and the indicator keeps the maximum weight value. When the weight is lower than 10d, the indicator frees the HOLD value automatically and shows the value lower to 10d.

The RS-232 port sends the PEAK value stored in HOLD. The transmission starts in the PEAK value and ends when the weight is below 10d.



8 Interface

RS-232 Pin Allocation

The indicator connector is a SUB-D 9 Female.

SUB-D 9 Connector Aerial male	INDICATOR		PC	
	Pin	Signal	Pin	Signal
Pin Assignment View from welded side	2	RXD	3	TXD
	3	TXD	2	RXD
	5	GND	5	GND

9 Maintenance

9.1 *Default Recovery for All Parameters*

(1) Unplug the power supply from the indicator. Adjust the calibration switch to "ON".
(2) Press and hold simultaneously [F1/Esc] [Enter]
(3) Plug in the power supply and turn on the indicator.
(4) The screen will show `In.tE.ALL`
(5) To confirm, press [Enter] and hold (aprox 10s) until showing `End`, and then adjust the calibration switch to "OFF".

WARNING
Once the device reset, verify if the values correspond with the desired application.

9.2 *Default Recovery for General Function Parameters*

(1) Turn off the indicator. Adjust the calibration switch to "OFF".
(2) Press and hold simultaneously [F1/Esc] [Enter]
(3) Turn on the indicator.
(4) The screen will show `In.tE.Fn`
(5) To confirm, press [Enter] and hold (aprox 10s) until re-Earning on.

WARNING
Once the device reset, verify if the values correspond with the desired application.

9.3 *Self-diagnosis Mode*

(1) Turn off the indicator.
(2) Press and hold [Zero]
(3) Turn on the indicator.
(4) The screen will show `UEr`, which means entered self-diagnosis mode.
(5) Use [Zero] or [Tare] keys to select item intended to test.
Press [Enter] key to enter self-diagnosis, and press [ESC] key to exit.

Item	Display	Testing Item
1	`UEr`	Program Version Number Displaying
2	`dSP`	7-Segment Display Testing
3	`KEY`	Keypad and Calibration Switch Testing
4	`AdC`	A/D Conversion Value Displaying
5	`EEP`	EEPROM Testing
6	Reserved	Reserved
7	`232`	OP-1 RS-232 Serial Output Interface Testing

9.3.1 Program Version Number
7-Segment display shows program version number `0080 XX`

9.3.2 7-segment Display Testing
7-Segment display shows `0` to `9` and "."

9.3.3 Keypad & Calibration Switch Testing
Adjust calibration switch to "ON", and press any key, the corresponding bit will be changed from `0` to `1`

9.3.4 A/D Conversion Value
7-Segment display shows the internal value of the scale.

9.3.5 EEPROM Testing
Showing `PASS` represents in normal condition.
Showing `FAIL` represents in abnormal condition.

9.3.6 RS-232 Serial Output Interface Testing
(1) Short Pin 2 and Pin 3 of the 9-pin D-SUB socket of serial output.
Showing `PASS` represents in normal condition.
Showing `FAIL` represents in abnormal condition.
(2) If connected with a computer (protocol have to match), the screen will show `0` to `9`, which means RS-232 output is in normal condition.

Appendix 7-SEGMENT DISPLAY CHARACTERS

Number	Display	Letter	Display	Letter	Display
0	0	A	A	N	n
1	1	B	b	O	o
2	2	C	C	P	P
3	3	D	d	Q	q
4	4	E	E	R	r
5	5	F	F	S	S
6	6	G	G	T	t
7	7	H	h	U	u
8	8	I	I	V	v
9	9	J	J	W	w
		K	K	X	x
		L	L	Y	y
°C	°C	M	n	Z	z

NOTES