



OPERATION MANUAL

MODEL: DS-700

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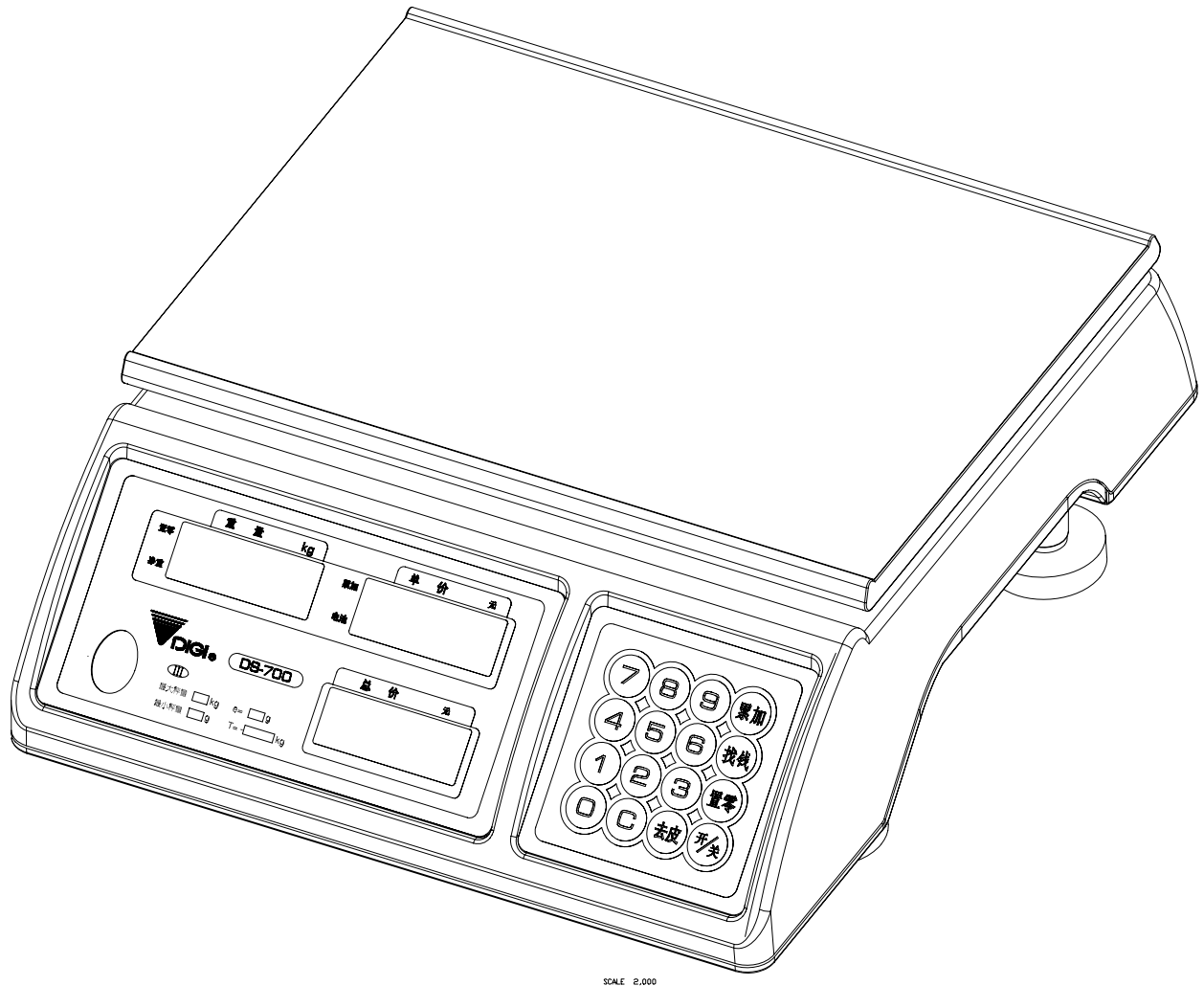
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1. General Specification

1.1. General Layout



1.2. Purpose

To develop a low cost and low power consumption bench scale for low end market.

1.3. Features

- * Extra low cost digital price computing scale.
- * Quick response to weight changes.
- * Capacity : 1.5kg, 3kg, 6kg, 15kg, 30kg, 3lb, 6lb, 15lb, 30lb and 60lb.
- * Resolution : Display Resolution 1/3000.
Internal Resolution 1/30000.
- * Low power consumption : Battery(Rechargeable battery or 6 x D size dry battery) backup for more than 500 hours of continuous usage.
- * Two-Point battery low detect.
 - A. When battery is weak, the Battery indicator will light up.

B. When the power from battery becomes low such that the scale can not compute accurately, all displays will shut off except the Battery indicator. The power is then shut off completely after 1 minute.

- * Calibration by software.
- * Splash proof.
- * Customer and operator displays.
- * 16 keys :
 - ON/OFF key.
 - 10 Numeric keys.
 - 5 Operational keys.
- * Plastic base (sandwich moulding)/top plastic case.
- * High contrast LCD display.
- * Flat platter. (optional part)

1.4. Operating Conditions

- * Power Source : AC 240/230/220V, 117/100V (+10%, -15%).
: DC 6 x D size dry battery (9V).
- * Operating Temperature : -10°C... +40°C. (OIML)
- * Operating Humidity : 15 ... 85% RH.
 - * Power Consumption : 3W when using AC power, 0.1W when using battery.

1.5. Analog Specification

- * Input sensitivity : 0.67mV/V - 2kg(J3, 1mV/V), 20kg(J30, 1mV/V).
: 0.75mV/V - 1.5kg(J1.5, 0.75mV/V), 10kg(J8, 0.6mV/V)
: 1mV/V – Others .
- * Zero adjust range : $0 \pm 2.5\text{mV}$.
- * Zero balance range : $0 \pm 0.5\text{mV}$.
- * L/C applied voltage : DC 5V.
- * Speed of A/D conversion : 3 times/sec.
- * Internal Resolution : 30000.

1.6. Capacity/Minimum Graduation/Tare range

1.6.1. Single Interval

Capacity	Minimum Graduation	Tare Rang
1.5kg	0.5g (1e = 10IR)	0 - 749.5g
3kg	1g (1e = 10IR)	0 - 1.499kg
6kg	2g (1e = 10IR)	0 - 2.998kg
15kg	5g (1e = 10IR)	0 - 7.495kg
30kg	10g (1e = 10IR)	0 - 14.99kg
3lb	0.001lb (1e = 10IR)	0 - 1.499lb
6lb	0.002lb (1e = 10IR)	0 - 2.998lb
15lb	0.005lb (1e = 10IR)	0 - 7.495lb
30lb	0.01lb (1e = 10IR)	0 - 14.99lb
60lb	0.02lb (1e = 10IR)	0 - 29.98lb

1.6.2. Multi-Interval

Capacity	Minimum Graduation		Tare Rang
1.5kg	(0-0.6kg) - 0.2g (1e=4IR)	(0.6-1.5kg) - 0.5g (1e=10IR)	0 - 599.8g
3kg	(0-1.5kg) - 0.5g (1e=5IR)	(1.5-3kg) - 1g (1e=10IR)	0 - 999.5g
6kg	(0-3kg) - 1g (1e=5IR)	(3-6kg) - 2g (1e=10IR)	0 - 2.999kg
15kg	(0-6kg) - 2g (1e=4IR)	(6-15kg) - 5g (1e=10IR)	0 - 5.998kg
30kg	(0-15kg) - 5g (1e=5IR)	(15-30kg) - 10g (1e=10IR)	0 - 9.995kg
6lb	(0-3lb) - 0.001lb (1e=5IR)	(3-6lb) - 0.002lb (1e=10IR)	0 - 2.999lb
15lb	(0-6lb) - 0.002lb (1e=4IR)	(6-15lb) - 0.005lb (1e=10IR)	0 - 5.998lb
30lb	(0-15lb) - 0.005lb (1e=5IR)	(15-30lb) - 0.010lb (1e=10IR)	0 - 9.995lb
60lb	(0-30lb) - 0.01lb (1e=5IR)	(30-60lb) - 0.02lb (1e=10IR)	0 - 29.99lb

*NOTE : IR -> Internal Resolution, e -> Division(Minimum Increment).

Internal count(full capacity) = 30000IR.

1.7. Dimensions

- * Platter size : 293 x 200mm.
- * Overall size : 300 x 330 x 124.5mm.

1.8. External Connectors

- * AC receptacle.

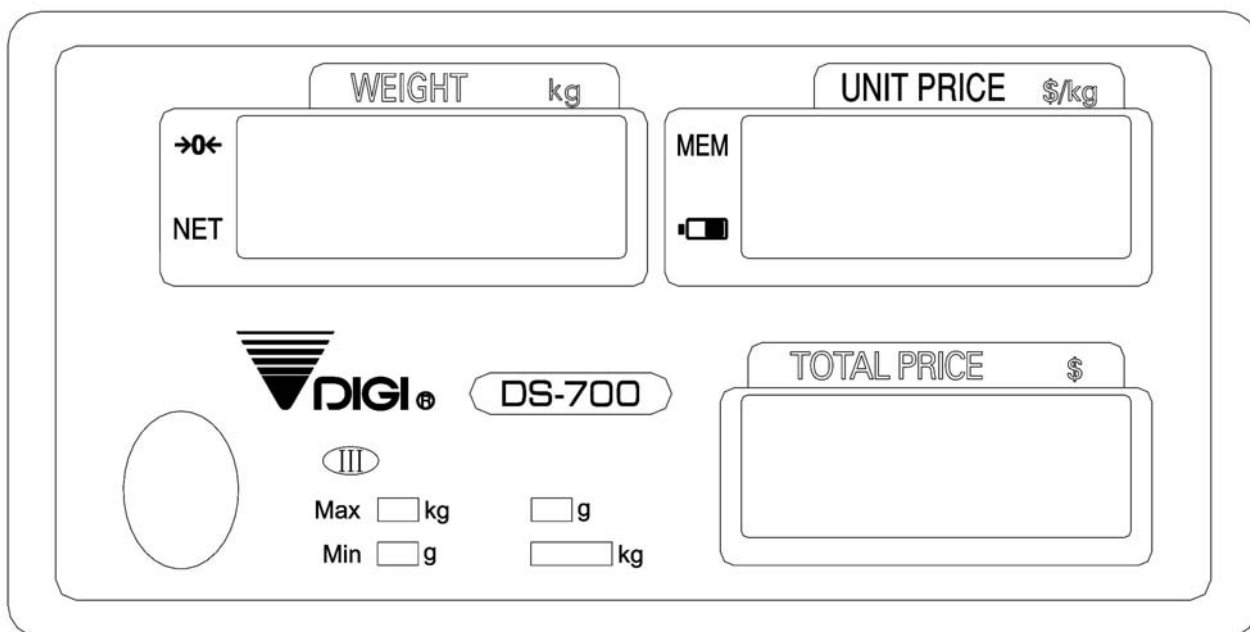
1.9. Main Components

- * Microcomputer : NEC uPD75P3018 / uPD75P3018A. (4 BIT, 18K PROM)
or NEC uPD753012 / uPD753012A. (4 BIT, 12K Mask ROM)
- * Crystal Oscillator : 4.19 MHz.
- * Display device : Liquid crystal display. (LCD)
- * Loadcell : 1k resistance J type loadcell. (OIML)

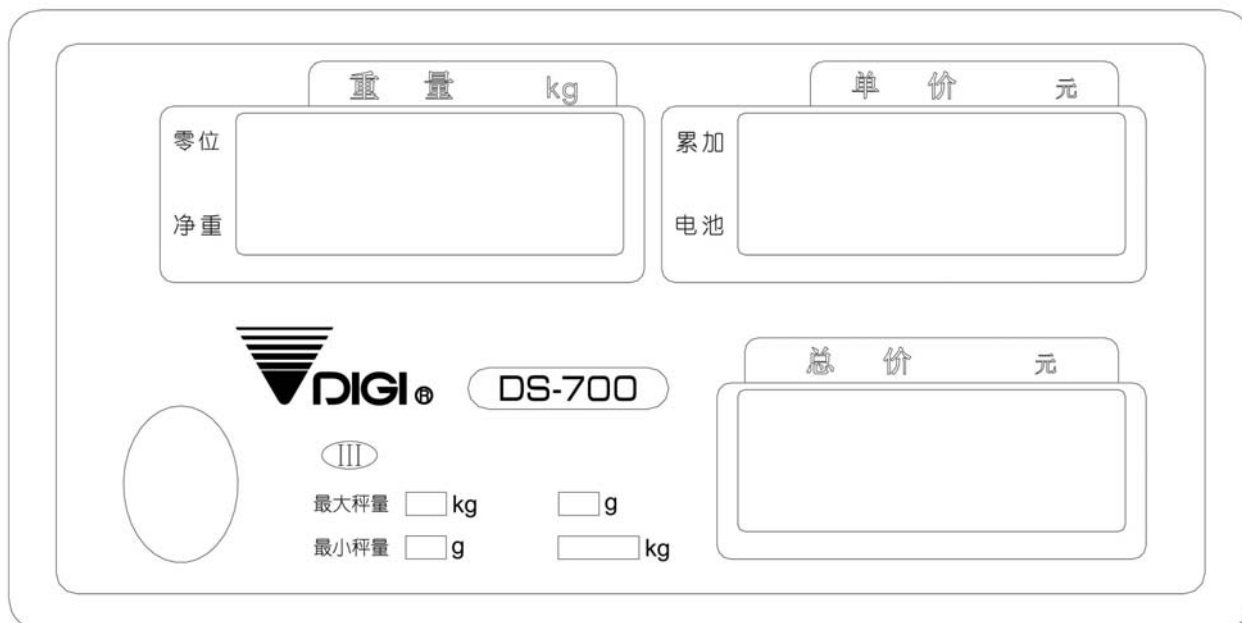
1.10. Existing parts to be used

- * Housing. (DS-671)
- * Platter. (DS-671)
- * Loadcell frame. (DS-671)
- * J type loadcell. (DS-671)

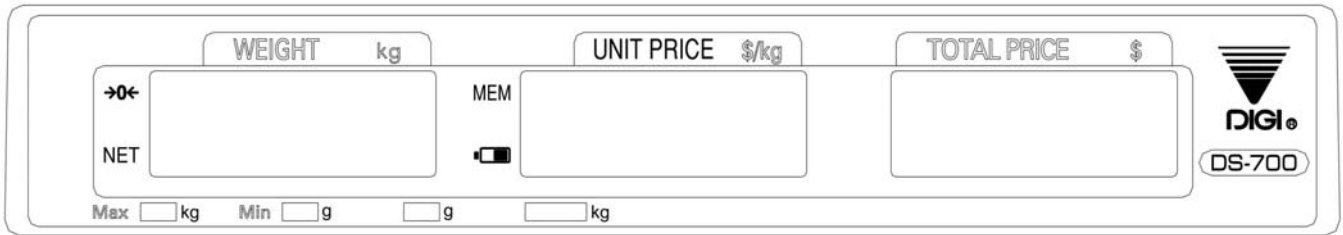
1.11. Display and Indicators



OP-DISP (for Export)



OP-DISP (for China)



CUST-DISP (for Export)



CUST-DISP (for China)


1.12. Display and Indicators

1.12.1. Display Specifications

- * Weight Display : 5 digits.
- * Unit Price Display : 5 digits.
- * Total Price Display : 6 digits.

1.12.2. Indicators

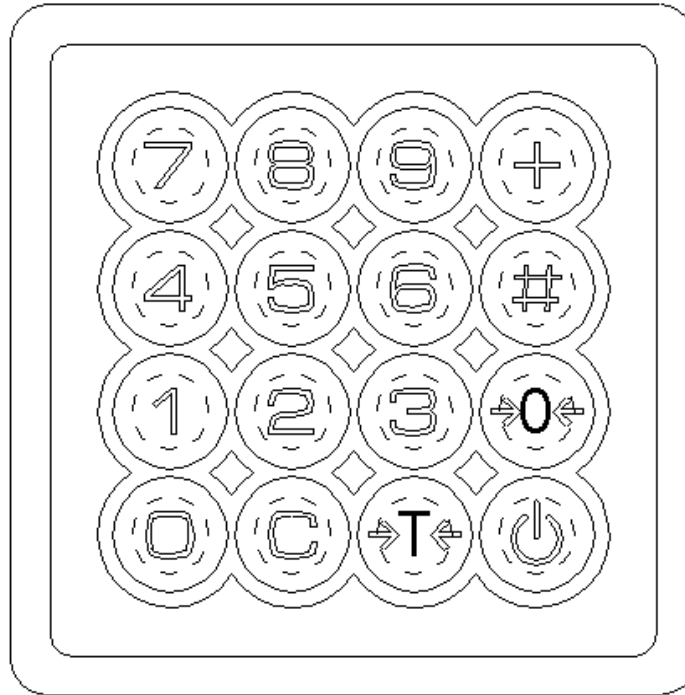
1.12.2.1. Export Version

- * ZERO : On when zero point is adjusted and weight is stable.
- * NET : On when tare subtraction is performed.
- * MEM : On when price is accumulating.
- *  : On when battery is weak and needs to change.

1.12.2.2. Chinese Version

- * 零位 : On when zero point is adjusted and weight is stable.
- * 净重 : On when tare subtraction is performed.
- * 累加 : On when price is accumulating.
- * 电池 : On when battery is weak and needs to change.

1.13. Keysheet Layout









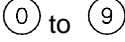
Standard Version (for Export)




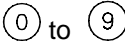
Standard Version (for China)

1.13.1. Key Functions

1.13.1.1 Export Version

-  : ON/OFF key. Turns the power ON or OFF.
-  : RE-ZERO key. Resets weight display to zero.
-  : AMT/TEND key. Enters amount tendered. Two different types of AMT/TEND. operation can be selected by SPEC 18 BIT 0. (for standard version)
-  : Accumulation key. Adds sum or accumulate sum.
-  : TARE key. Set or clears tare value.
-  : CLEAR key. Clears numerical values.
-  : Numeric keys. Input numerical value.

1.13.1.2 Chinese Version

- [开/关] : ON/OFF key. Turns the power ON or OFF.
- [置零] : RE-ZERO key. Resets weight display to zero.
- [找钱] : AMT/TEND key. Enters amount tendered. Two different types of AMT/TEND. operation can be selected by SPEC 18 BIT 0. (for standard version)
- [累加] : Accumulation key. Adds sum or accumulate sum.
- [去皮] : TARE key. Set or clears tare value.
-  : CLEAR key. Clears numerical values.
-  : Numeric keys. Input numerical value.

1.14. Notable differences from current Teraoka scales:

- * Extra low cost digital price computing scale.

3. Main Operations

3.1. Power On/Off

1 - ZERO 2 - NET
3 - MEMORY 4 - BATTERY

OPERATION	WEIGHT	U.PRICE	T.PRICE	1	2	3	4	REMARKS
[ON/OFF]	V r x. x x							Display software version for 2s.*Note1
	8.8.8.8.8	8.8.8.8.8	8888.8.8	▼	▼	▼	▼	Display for 1.5s. *Note2 Blank for 1.5s.
	8.8.8.8.8	8.8.8.8.8	8888.8.8	▼	▼	▼	▼	Display for 1.5s. Blank for 1.5s.
Ready to operate	0.0 0 0	0.0 0	0.0 0	▼				Weighing mode. OFF.
[ON/OFF]								

* Note1: Depends on SPEC18.2 setting.

* Note2: Power On Segment Check Style can be selected by setting SPEC18.3. In this example assume SPEC18.3 = 0.

3.2. Tare Subtraction

3.2.1. One Touch Tare Subtraction

1 - ZERO 2 - NET
3 - MEMORY 4 - BATTERY

OPERATION	WEIGHT	U.PRICE	T.PRICE	1	2	3	4	REMARKS
	0.0 3 0	0.0 0	0.0 0					Put tare (e.g 30 g) on platter.
[T]	0.0 0 0	0.0 0	0.0 0		▼			Subtract the tare weight.
Remove the tare weight	- 0.0 3 0	0.0 0	0.0 0	▼	▼			
[T]	0.0 0 0	0.0 0	0.0 0	▼				Clear the tare weight.

3.2.2. Digital Tare Subtraction

1 - ZERO 2 - NET
3 - MEMORY 4 - BATTERY

OPERATION	WEIGHT	U.PRICE	T.PRICE	1	2	3	4	REMARKS
[5]	0.0 0 0	0.0 5	0.0 0	▼				Key in the tare weight (e.g 5g).
[T]	- 0.0 0 5	0.0 0	0.0 0	▼	▼			Subtract the tare weight (Assume 15kg).
[T]	0.0 0 0	0.0 0	0.0 0	▼				Clear the tare weight.

3.3. Plural Operation

3.3.1. Standard Version

1 - ZERO 2 - NET
3 - MEMORY 4 - BATTERY

OPERATION	WEIGHT	U.PRICE	T.PRICE	1	2	3	4	REMARKS
[1] [2] [5] [0]	0.0 0 0	1 2.5 0	0.0 0	▼				Enter unit price.
Put product on platter.	0.4 2 0	1 2.5 0	5.2 5					
[+]	t O t A L	1	5.2 5			▼		Accumulation the data.
Remove product from platter.	t O t A L	1	5.2 5			▼		
[5] [0] [0]	0.0 0 0	5.0 0	0.0 0	▼		▼		Enter unit price.
[+]	t O t A L	2	1 0.2 5			▼		Fixed price accumulation.
[C]	0.0 0 0	0.0 0	0.0 0	▼				Clear current total then return to Weighing mode.
[+]	t O t A L	0	0.0 0					Enter accumulation mode.
[+]	t O t A L	0	0.0 0					Nothing happen.
[C]	0.0 0 0	0.0 0	0.0 0	▼				Return to Weighing mode.

3.3.2. Japan Type A Version (When SPEC21.BIT0 = 1 and SPEC17.BIT2 = 0)

1 - ZERO 2 - NET
3 - MEMORY 4 - BATTERY

OPERATION	WEIGHT	U.PRICE	T.PRICE	1	2	3	4	REMARKS
[1] [0] [0] [0].	0.0 0 0	1 0.0 0	0.0 0	▼				Enter unit price.
Put product on platter.	0.5 0 0	1 0.0 0	5.0 0					
[+].	A d d	1]	5.1 5			▼		Accumulation the data (tax rate = 3%).
Remove product from platter.	A d d	1]	5.1 5			▼		
[1] [5] [0] [0].	0.0 0 0	1 5.0 0	0.0 0	▼		▼		Enter unit price.
[+].	A d d	2]	2 0.6 0			▼		Fixed price accumulation.
[C].	0.0 0 0	0.0 0	0.0 0	▼				Clear current total then return to Weighing mode.
[+].	A d d	0]	0.0 0					Enter accumulation mode.
[C].	0.0 0 0	0.0 0	0.0 0	▼				Return to Weighing mode.

3.3.3. Japan Type B Version (When SPEC21.BIT0 = 1 and SPEC17.BIT2 = 1)

1 - ZERO 2 - NET
3 - MEMORY 4 - BATTERY

OPERATION	WEIGHT	U.PRICE	T.PRICE	1	2	3	4	REMARKS
[1] [0] [0] [0].	0.0 0 0	1 0.0 0	0.0 0	▼				Enter unit price.
Put product on platter.	0.5 0 0	1 0.0 0	5.0 0					
[+].	A d d	5.0 0	5.1 5			▼		Accumulation the data (tax rate = 3%).
Remove product from platter.	A d d	5.0 0	5.1 5			▼		
[1] [5] [0] [0].	0.0 0 0	1 5.0 0	0.0 0	▼				Enter unit price.
[+].	A d d	2 0.0 0	2 0.6 0			▼		Fixed price accumulation.
[C].	0.0 0 0	0.0 0	0.0 0	▼				Clear current total then return to Weighing mode.
[+].	A d d	0.0 0	0.0 0					Enter accumulation mode.
[C]	0.0 0 0	0.0 0	0.0 0	▼				Return to Weighing mode.

3.4. AMT/TEND Key Operation (Standard Version Only, SPEC9.BIT0 = 1)

3.4.1. Method A (Direct entry method: SPEC18.BIT3 = 1)

1 - ZERO 2 - NET
3 - MEMORY 4 - BATTERY

OPERATION	WEIGHT	U.PRICE	T.PRICE	1	2	3	4	5	REMARKS
[1] [2] [5] [0]	0.0 0 0	1 2.5 0	0.0 0	▼					Enter unit price.
Put product on platter.	0.4 2 0	1 2.5 0	5.2 5						
[+]	t O t A L	1	5.2 5			▼			Accumulation the data.
Remove product from platter.	t O t A L	1	5.2 5			▼			
[6] [0] [0]	0.0 0 0	6.0 0	0.0 0	▼					Enter the amount tendered.
[#]	C H G	6.0 0	0.7 5			▼			Compute and display change.
[C]	0.0 0 0	0.0 0	0.0 0	▼					Clear current total then return to Weighing mode.
[+]	t O t A L	0	0.0 0						Check total data.
[C]	0.0 0 0	0.0 0	0.0 0	▼					Return to Weighing mode.

3.4.2. Method B (Indirect entry method: SPEC18.BIT3 = 0)

1 - ZERO 2 - NET
3 - MEMORY 4 - BATTERY

OPERATION	WEIGHT	U.PRICE	T.PRICE	1	2	3	4	5	REMARKS
[1] [2] [5] [0]	0.0 0 0	1 2.5 0	0.0 0	▼					Enter unit price.
	0.4 2 0	1 2.5 0	5.2 5						Put product on platter.
[+]	t O t A L	1	5.2 5			▼			Accumulation the data.
[#]	C H G	5.2 5	0.0 0			▼			Prepare to compute change.
[6] [0] [0]	C H G	6.0 0	0.7 5			▼			U.Price column display tendered amount while T.Price column display computed change.
Remove product from platter.	C H G	6.0 0	0.7 5			▼			
[C]	0.0 0 0	0.0 0	0.0 0	▼					Clear current total then Return to Weighing mode.
[+]	t O t A L	0	0.0 0						Check total data.
[C]	0.0 0 0	0.0 0	0.0 0	▼					Return to Weighing mode.

3.5 AMT/TEND Key Operation (Standard Version Only, SPEC9.BIT0 = 1)

3.5.1. Method A (Direct entry method: SPEC18.BIT3 = 1)

1 - ZERO 2 - NET
3 - MEMORY 4 - BATTERY

OPERATION	WEIGHT	U.PRICE	T.PRICE	1	2	3	4	REMARKS
[1] [2] [5] [0]	0.0 0 0	1 2.5 0	0.0 0	▼				Enter unit price.
Put product on platter.	0.4 2 0	1 2.5 0	5.2 5					
[+]	t O t A L	1	5.2 5			▼		Accumulation the data.
Remove product from platter.	t O t A L	1	5.2 5			▼		
[6] [0] [0]	0.0 0 0	6.0 0	0.0 0	▼		▼		Enter the amount tendered.
[#]	C H G	6.0 0	0.7 5			▼		Compute and display change.
[C]	0.0 0 0	0.0 0	0.0 0	▼				Clear current total then return to Weighing mode.
[+]	t O t A L	0	0.0 0					Check total data.
[C]	0.0 0 0	0.0 0	0.0 0	▼				Return to Weighing mode.

3.5.2. Method B (Indirect entry method: SPEC18.BIT3 = 0)

1 - ZERO 2 - NET
3 - MEMORY 4 - BATTERY

OPERATION	WEIGHT	U.PRICE	T.PRICE	1	2	3	4	REMARKS
[1] [2] [5] [0]	0.0 0 0	1 2.5 0	0.0 0	▼				Enter unit price.
	0.4 2 0	1 2.5 0	5.2 5					Put product on platter.
[+]	t O t A L	1	5.2 5			▼		Accumulation the data.
[#]	C H G	5.2 5	0.0 0			▼		Prepare to compute change.
[6] [0] [0]	C H G	6.0 0	0.7 5			▼		U.Price column display tendered amount while T.Price column display computed change.
Remove product from platter.	C H G	6.0 0	0.7 5			▼		
[C]	0.0 0 0	0.0 0	0.0 0	▼				Clear current total then Return to Weighing mode.
[+]	t O t A L	0	0.0 0					Check total data.
[C]	0.0 0 0	0.0 0	0.0 0	▼				Return to Weighing mode.

3.6. Price Base Change By 100g/kg Key (Available when SPEC22.BIT3 = 0)

1 - ZERO 2 - NET
3 - \$/100g 4 - BATTERY

OPERATION	WEIGHT	U.PRICE	T.PRICE	1	2	3	4	REMARKS
[1] [0] [0].	0.0 0 0	1.0 0	0.0 0	▼				Key in unit price.
[100g/kg].	0.0 0 0	1.0 0	0.0 0	▼		▼		Change price base to \$/100g.
Put product on platter.	1.0 0 0	1.0 0	1 0.0 0			▼		
[C].	1.0 0 0	0.0 0	0.0 0					C key clear unit price and price base.
[100g/kg].	1.0 0 0	0.0 0	0.0 0			▼		Change price base to \$/100g.
[2] [0] [0].	1.0 0 0	2.0 0	2 0.0 0			▼		Key in unit price.
[100g/kg].	1.0 0 0	2.0 0	2.0 0					Change price base to \$/kg.
Remove product, [C].	0.0 0 0	0.0 0	0.0 0	▼				

3.7. kg and tahl conversion by UNIT Key (Available when SPEC20.2 = 0)

1 - ZERO 2 - NET
3 - MEMORY 4 - \$/tahl
5 - BATTERY

OPERATION	WEIGHT	U.PRICE	T.PRICE	1	2	3	4	5	REMARKS
Put product on platter.	0.5 0 0	0.0 0	0.0 0						Weight in kg.
[2] [0] [0].	0.5 0 0	2.0 0	1.0 0						Key in unit price in \$/kg.
Remove product, [C].	0.0 0 0	0.0 0	0.0 0	▼					
[UNIT].	0.0 0	0.0 0	0.0 0				▼		Change to tahl.
Put product on platter.	1 3.2 0	0.0 0	0.0 0				▼		Weight in tahl.
[2] [0] [0].	1 3.2 0	2.0 0	2 6.4 0				▼		Key in unit price in \$/tahl.
[UNIT].	0.5 0 0	2.0 0	1.0 0						Change to kg.
Remove product, [C].	0.0 0 0	0.0 0	0.0 0	▼					

3.8. lb and kati conversion by UNIT Key (Available when SPEC20.1 = 0)

1 - ZERO 2 - NET
3 - MEMORY 4 - \$/kati
5 - BATTERY

OPERATION	WEIGHT	U.PRICE	T.PRICE	1	2	3	4	5	REMARKS
Put product on platter.	2.2 0 0	0.0 0	0.0 0						Weight in lb.
[2] [0] [0].	2.2 0 0	2.0 0	4.4 0						Key in unit price in \$/lb.
Remove product, [C].	0.0 0 0	0.0 0	0.0 0	▼					
[UNIT].	0. 0 0	0.0 0	0.0 0				▼		Change to kati.
Put product on platter.	1.1 0.4	0.0 0	0.0 0				▼		Weight in kati.
[2] [0] [0].	1.1 0.4	2.0 0	3.3 0				▼		Key in unit price in \$/kati.
[UNIT].	2.2 0 0	2.0 0	4.4 0						Change to kg.
Remove product, [C].	0.0 0 0	0.0 0	0.0 0	▼					

3.9. Currency Conversion by EURO Key (Available when SPEC20.BIT3 = 0)

3.9.1. Currency Conversion Operation Method 1 (SPEC2.BIT0 = 0)

1 - ZERO 2 - NET 3 - BATTERY

OPERATION	WEIGHT	U.PRICE	T.PRICE	1	2	3	REMARKS
Put product on platter.	0.5 0 0	0.0 0	0.0 0				
[2] [0] [0].	0.5 0 0	2.0 0	1.0 0				Key in unit price.
[EURO].	E U R O		2.2 0				Display re-calculated total price in secondary currency. Assume conversion rate is 2.20.
[EURO].	0.5 0 0	2.0 0	1.0 0				Return to Weighing Mode.

3.9.2. Currency Conversion Operation Method 2 (SPEC2.BIT0 = 1)

1 - ZERO 2 - NET 3 - BATTERY

OPERATION	WEIGHT	U.PRICE	T.PRICE	1	2	3	REMARKS
Put product on platter.	0.5 0 0	0.0 0	0.0 0				
[2] [0] [0].	0.5 0 0	2.0 0	1.0 0				Key in unit price.
[EURO].	E U R O	4.4 0	2.2 0				Display re-calculated unit price & total price in secondary currency. Assume conversion rate is 2.20.
[EURO].	0.5 0 0	2.0 0	1.0 0				Return to Weighing Mode.

4.0. Conversion Rate Setting (Available when SPEC21.BIT3 = 0)

1 - ZERO 2 - NET 3 - BATTERY

OPERATION	WEIGHT	U.PRICE	T.PRICE	1	2	3	REMARKS
[M] [M].	2.0 0 0	0.0 0	0.0 0				Weighing mode.
[M] [M].	E U R O	r A t E	0				Depress M key twice within 3 seconds (or press REZERO + 8 8 8) to enter into conversion rate setting mode.
[2] [2] [0].	E U R O	r A t E	2. 2 0				Set conversion rate to 2.20.
[M].	2.0 0 0	0.0 0	0.0 0				Return to Weighing mode.

4. Error Message List

The following error message will appear when an incorrect operation is performed.

Message	Remarks	Appropriate Operation
O F	When displayed weight exceeded capacity+9d, or weight is on the platter when power on.	Remove the weight on the platter.
U F	When displayed minus weight $\geq 9d$.	REZERO or ON/OFF again.
E R R O R	Calibration operation is not correct, or A/D checking error when power on.	Repeat calibration operation.
# # # # #	When scale is not steady when power on.	Place scale on firm, flat base.
TotAl FULL	When current Total overflow.	Clear current Total.

* Note : "# # # # #" - All Segments.