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WEIGHTS AND MEASURES (PATTERNS OF INSTRUMENTS) REGULATIONS

#### **REGULATION 9**

#### CERTIFICATE OF APPROVAL No 6/4D/77

This is to certify that an approval has been granted by the Commission that the pattern and variants of the

Berkel Model ED-M Weighing Instrument

submitted by Berkel Australia Pty Ltd, 19 Evans Street, Burwood, Victoria, 3125,

are suitable for use for trade.

The approval of the pattern and variants is subject to review on or after 1/6/83.

All instruments purporting to comply with this approval shall be marked NSC No 6/4D/77.

Relevant drawings and specifications are lodged with the Commission.

Signed Exedut ve Director

#### Descriptive Advice

Pattern: approved 7/3/78

Berkel model ED-M price computing weighing instrument of 2.599 kg capacity by 0.001 kg scale intervals.

Variants: approved 7/3/78

- Of 9.995 kg capacity by 0.005 kg scale intervals.
- 2. Of 5.198 kg capacity by 0.002 kg scale intervals.
- 3. Without price-look-up keys and known as model ED-SL.
- 4. Model ED-SL with a mechanical indicator and without tare functions and known as a model ED-S.
- 5. Model ED-SL without integral ticket printer with the mass and price\_computing console in a smaller housing and known as model ED-L II.

Technical Schedule No 6/4D/77 dated 26/5/78 describes the pattern and variants 1 to 5.

Variants: approved 27/6/79

- 6. Model ED-L II components in a single housing and known as model 560.
- 7. Model ED-L II or model 560 as a prepackaging weighing instrument with a Berkel 3107 label printer.
- Model ED-L or model 560 as a retail counter instrument with a Berkel 3100 printer printing tickets with mass, unit price and price or with price only.

Technical Schedule No 6/4D/77 Variation No 1 dated 4/9/79 (updated by Notification of Change No 2 dated 21/4/80) describes variants 6 to 8.

Variant: approved 16/9/82

9. With an output socket for peripheral equipment.

Technical Schedule No 6/4D/77 Variation No 2 dated 29/9/82 describes variant 9.

#### Filing Advice

Certificate of Approval No 6/4D/77 dated 4/9/79 is superseded by this Certificate and may be destroyed.

The documentation for this approval now consists of:

Certificate of Approval No 6/4D/77 dated 29/9/82 Technical Schedule No 6/4D/77 dated 26/5/78 (including special tests and Tables 1, 2 and 3) Technical Schedule No 6/4D/77 Variation No 1 dated 4/9/79 (replaced 21/4/80) Technical Schedule No 6/4D/77 Variation No 2 dated 29/9/82 Figures 1 to 11 dated 26/5/78 Figures 12 to 17 dated 4/9/79.



### TECHNICAL SCHEDULE No 6/4D/77

Pattern: Berkel Weighing Instrument Model ED-M

Submittor: Euroscale Pty Ltd, 19 Evans Street, Burwood, Victoria, 3125.

Date of Approval: 7 March 1978

All instruments conforming to this approval shall be marked "NSC No 6/4D/77".

#### Description:

The pattern is a self-indicating price-computing ticket-printing weighing instrument of capacity 2,599 kg by 0,001-kg graduations, with price-computing in 1-c increments to \$99,99 per kg and total price to \$259,87 (see Figures 1 and 2). Weight, tare weight, unit price and computed price are digitally indicated on both the vendor's and purchaser's sides of the instrument (see Figures 3 and 4). The instrument comprises a weighing unit and a weight-andprice console interconnected by a plug-in cable.

The weighing unit contains a vibrating-string weigh cell, which generates a change in frequency proportional to the weight applied. The weighing unit is provided with an automatic locking device which is actuated by movement of tilting of the weighing unit; the locking device is disengaged by pulling up a tab on the front of the weighing unit. The serial number of the weighing unit and the weight-and-price console are sealed on to the weighing unit by the stamping plug on the side of the weighing unit. This stamping plug prevents the cover being removed from the weighing unit. A manual zero adjustment is not provided on the weighing unit.

The weight-and-price-computing console converts the signal from the weighing unit to a weight which is displayed on both sides of the console. The unit price is either entered into the console by means of the ten-button keyboard or recalled from either an internal or external memory by means of the price-look-up keyboard and entered into the console. The price calculated by the console, the unit price entered by the keyboard or recalled from memory, and the weight, are displayed on the vendor's and purchaser's sides of the

26/5/78

console.

The unit price is cleared by pressing the button marked "C", or is automatically cleared when the weight indicator returns to zero. Pressing the fix-unit-price button "F" retains the unit price when the weight indicator returns to zero; this is indicated by illumination of the word "fix".

A ticket duplicating the displayed weight, unit price and computed price may be printed by pressing the print button marked "W" or "\_\_\_\_". Such computed prices may be totalised and displayed on the computedprice indicator, and printed on the ticket — with other prices not associated with the weighing function, which are entered by means of the ten-button keyboard and displayed and printed by pressing the hand-entry button marked "H" or "\_\_\_\_" — when the total display button "\*" and the print button are sequentially pressed.<sup>1</sup> The value of a wrong item printed on the ticket may be subtracted by re-entering the value on the keyboard and pressing the minus "-" button.

The number of items printed on the ticket is indicated on the vendor's and purchaser's sides of the instrument. A sample ticket is illustrated in Figure 5.

An automatic zero-setting system is provided which monitors the weight information and resets zero within 0,25e whenever the instrument comes to rest within 0,5e of zero.

Additionally, the automatic zero-setting device will reset zero when the instrument is switched on provided the instrument is within 20c of the factory-set reference point, and when a negative load change of not more than 20e occurs, for example, when a soiled load receptor is cleaned.

A self-initiating zero-check test programme occurs every 0,4s when the instrument is not loaded; if an error in zero setting is encountered an error signal is given and the instrument becomes inoperative until the fault is cleared.

- A signal may be provided to unlatch a cash drawer and/or transfer data to a peripheral device when the total display button "\*" and print button marked "W" or " are sequentially pressed.
- A separate zero-balance indicator is not provided as the automatic zero-setting system together with the self-initiating zero-check test programme ensures the indication of zero weight always means zero within 0,25e.

A semi-automatic subtractive taring device with a maximum effect of 200e is provided. A container of weight up to 200e, placed on the load receptor, is tared to within 0,25e when the tare button "T" is pressed. The value of the tare is indicated to the nearest whole graduation on tare-weight indicators on the purchaser's and vendor's sides of the instrument, and zero  $\pm$  0,25e is indicated on the main weight indicators. When the container is removed the weight indicator goes blank; the tare-weight indicator continues to display the tare value.

When the filled container is placed on the load receptor, the main weight indicator indicates a net weight. The tare value remains throughout the weighing. The tare is automatically cancelled when the net weight is printed and the filled container is removed from the load receptor.

The instrument is approved for retail counter use.

The indications of weight and computed price blank out when the load is below zero or above capacity and when the load is not steady.

At equilibrium a circuit within the computer electronically adjusts the discrimination of the instrument from less than 0,0005 kg to 0,003 kg. This stabilises the weight indication, minimising the effect of vibration or wind loading, and prevents alternate indications of adjacent values if the load causes the instrument to be at a changeover point between graduations. A 0,003-kg change in the load, or selection of a different unit price, will override the discrimination circuit and cause the instrument to reassess the condition of equilibrium.

The instrument is marked adjacent to each weight reading face:

	(III)	
Max	=	2,599 kg
Min	=	0,01 kg
d₁ = e	=	0,001 kg
T	=	- 0,2 kg

A shield over the computing circuit boards is retained by two knurled thumbscrews, one of which is drilled and sealed to a drilled set screw by a lead-and-wire seal (see Figure 6). The seal is accessible by hingeing-down the front panel (see Figure 6).

An output socket which may be fitted on the weight-and-price console may provide data to peripheral devices which are not a part of the measuring instrument.<sup>1</sup> These devices, which may only be provided with the authorisation of the Weights and Measures Authority of the State, may, for example, store and process the data, or print weight, etc. Provision is made to seal the output socket (see Figure 7) to prevent the addition of peripheral equipment or to seal peripheral equipment to the output socket (see Figure 8).

The approval includes the following:

 The instrument of capacity 9,995 kg by 0,005-kg graduations. The discrimination of the instrument is automatically adjusted from less than 0,005 kg to 0,01 kg when the instrument is in equilibrium. A 0,01-kg change in the load or the selection of a different unit price will override the discrimination circuit and cause the instrument to reassess the condition of equilibrium.

The instrument is marked adjacent to the weight reading face:

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1	<b>TTT</b>	
ų –	111 /	
~		

Max	=	9,995 kg
Min	æ	0,1 kg
d <sub>é</sub> = e	=	0,005 kg
T	22	- 1 kg

2. The instrument of capacity 5,198 kg by 0,002-kg graduations. The discrimination of the instrument is automatically adjusted from less than 0,001 kg to 0,003 kg when the instrument is in equilibrium. A 0,003-kg change in the load or the selection of a different unit price will override the discrimination and cause the instrument to reassess the condition of equilibrium.

The instrument is marked adjacent to the weight reading face:

<sup>1</sup> A measuring instrument examined and approved by the Commission is limited to the devices which determine the value of a physical quantity, calculate and indicate, or indicate and print price in the presence of the purchaser or vendor, control the measurement, and indicate the result of the measurement on a visual display, for example, a seven-segment indicator. A cash register which receives data from the output socket of the weight-and-price console is a part of the measuring instrument and requires approval by the Commission.

Page	5
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			III	
Max			=	5,198 kg
Min			22	0,04 kg
d	=	e	=	0,002 kg
Т				- 0,4 kg

- 3. The ED-M without price-look-up keys and without the internal unit-price memory; the instrument is known as the ED-SL (see Figure 9).
- 4. The ED-SL with a mechanical indicator and without tare; the instrument is known as the ED-S (see Figure 10).
- 5. The ED-SL without the ticket printer, totalising, hand-entry and minus-entry functions and in a smaller housing; the instrument is known as the ED-L II (see Figure 11). The instrument is sealed by a lead-and-wire seal which passes through the drilled heads of two of the set screws which retain the cover on the instrument. This may be the same seal as the peripheral output socket.

#### Special Tests:

- Zero test as the automatic device resets zero when the weighing mechanism is in equilibrium within 0,5 graduation of zero, zero should be checked as described in the Commission's Test Procedure for the Elimination of Rounding Errors for Weighing Instruments with Digital Indication (Document 104), with, say, a load equivalent to 40 graduations on the load receptor. The indications with 0,25e and 0,75e additional weight on the load receptor should then be 40e and 41e respectively.
- <u>Discrimination</u> at equilibrium the discrimination is electronically adjusted to be not less than 0,003 kg (0,010 kg)<sup>1</sup>, (0,003 kg). This setting may be checked in the following manner:

With the load on the instrument adjusted so that the weight indicated is at a changeover point and with the higher of the two readings indicated, gently placing a load of 0,0034 kg  $(0,012 \text{ kg})^1$ ,  $(0,0034 \text{ kg})^2$  on the load receptor should cause the weight indicated to increase by not less than  $0,003 \text{ kg} (0,010 \text{ kg})^1$ ,  $(0,003 \text{ kg})^2$ .

<sup>&</sup>lt;sup>1</sup> Figures in brackets refer to the instrument with 0,005-kg graduations.

Figures in brackets refer to the instrument with 0,002-kg graduations.

#### Note:

Determination of Changeover Point: Selection of a new unit price overrides the discrimination circuit and causes the instrument to reassess the condition of equilibrium. The changeover point may therefore be found by changing the unit price as the load is varied. This will cause the input from the weigh cell to be rechecked at each unit-price change. A changeover point will be indicated when at two different unit prices the same load indicates adjacent values, say, 0,309 kg and 0,310 kg (1,090 kg and 1,095 kg)<sup>1</sup>, (0,308 kg and 0,310 kg)<sup>2</sup>.

An alternative to changing the unit price is to remove and replace, say, a 1-kg weight each time the load is varied. Again, changeover points will be indicated when the same load indicates adjacent values, say, 1,109 kg and 1,110 kg  $(1,090 \text{ kg and} 1,095 \text{ kg})^1$ ,  $(1,108 \text{ kg and 1,110 kg})^2$ .

3. <u>Level sensitivity</u> — as the automatic zero device prevents the zero from changing when the instrument is tilted at zero load, the effect of tilt should be initially checked with a small load on the instrument, say, 40e.

When the instrument is tilted to a slope of 1 in 20, the indication (40e) should not change by more than 2 graduations, and when the 40e load is removed and zero allowed to reset in the tilted position, the instrument should satisfy the weighing-accuracy specification, that is,  $\pm \frac{1}{2}$  graduation for the first 500 graduations,  $\pm 1$  graduation over 500 and up to 2000 graduations and  $\pm \frac{1}{2}$  graduations over 2000 graduations.

4. <u>Price-computing accuracy</u> — the indications and printing of weight, unit price and total price as listed in Tables 1, 2 or 3 will indicate that the price-computing and weight circuits are functioning correctly. The exact figures should be indicated as rounding is effected within the computer.

Note: This test does not establish correct weight indications; a separate test, which may be carried out in conjunction with this test, in accordance with the Commission's recommended testing procedure for the elimination of rounding errors — Document 104 — is necessary.

<sup>&</sup>lt;sup>1</sup> Figures in brackets refer to the instrument with 0,005-kg graduations.

Figures in brackets refer to the instrument with 0,002-kg graduations.

- 5. <u>Taring</u> (all models except ED-S) the indication of weight should not reset to zero, and a tare value should not be indicated, when the tare button "T" is pressed with a load of, say, 205e on the load receptor.
- 6. <u>Range of indication</u> the maximum weight indicated should not exceed the maximum capacity; above this weight the indicator should be blank.

	TABLE 1	
1	2	3
Indicated and	¢/kg	Computed
printed weight		price
kg	\$	\$
0	0	0
0 010	99 99	01 00
0,011	89 99	00,99
0 012	79 99	00,96
0.013	69 99	00,91
0 014	59 99	00.84
0.015	49 99	00,75
0.016	39,99	00,64
0.017	29,99	00,51
0.018	19,99	00,36
0.019	09,99	00,19
0.020	98,99	01,98
0,030	97,99	02.94
0,040	96,99	03.88
0,050	95,99	04,80
0,060	94,99	05,70
0.070	93,99	06,58
0.080	92,99	07.44
0,090	91.99	08.28
0,100	90,94	09.09
0,200	97.85	19.57
0,300	99.79	29,94
0,400	99,69	39,88
0,500	99,58	49.79
0,600	99.47	59.68
0,700	99,36	69,55
0,800	99,25	79,40
0,900	99,14	89.23
1,000	99,03	99,03
1,500	99,92	149,88
2,000	99,91	199,82
2,500	99,90	249,75
2,599	99,99	25 <b>9</b> ,87

Test Specification — Price-computing 2,559-kg by 0,001-kg Instrument

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	TABLE 2	
1	2	3
Indicated and	Ş/kg	Computed
printed weight	\$	price
кд	Ş	Ş
0,000	00,00	0,00
0,040	99,99	4,00
0,052	99,81	5,19
0,064	99,76	6,38
0,076	99,67	7,57
0,088	99,59	8,76
0,090	99,49	8.95
0,110	99,39	10,93
0,220	91,29	20,08
0,330	92,19	30,42
0,400	93,99	37,60
0,500	94,80	47,40
0,600	95,92	57,55
0,700	96,93	67,85
0,800	97,94	78,35
0,900	98,90	89,01
1,000	11,24	11,24
1,500	29,00	43,50
2,000	39,98	79,96
2,500	49,00	122,50
3,000	59,99	179,97
3,500	69,90	244,65
4,000	79,95	319.80
4,500	89,90	404.55
5,000	99,99	499,95
5,198	99,99	519,75

Test Specification — Price-computing 5,198-kg by 0,002-kg Instrument

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	TABLE 3	
1 Indicated and	2	3 Computed
nrinted weight	\$7 Kg	Drice
ka	¢	¢ ¢
~5	Ŷ	Ŷ
0,000	00,00	0,00
0,100	99 <b>,9</b> 9	10,00
0,105	98,99	10,39
0,110	97,99	10,78
0,120	96,99	11,64
0,130	95,99	12,48
0,140	94,99	13,30
0,150	93,99	14,10
0,160	92,99	14,88
0,170	91,99	15,64
0,180	90,96	16,37
0,190	<b>89,</b> 88	17,08
0,200	79,77	15,95
0,300	69,66	20,90
0,400	59,55	23,82
0,500	49,44	24,72
0,600	39,33	23,60
0,700	29,22	20,45
0,800	19,11	15,29
0,900	9,14	8,23
1,000	30,57	<b>30,</b> 57
2,000	70,03	140,06
3,000	84,67	254,01
4,000	92,00	368,00
5,000	95,00	475,00
6,000	97,00	582,00
7,000	99,00	693,00
8,000	99,50	796,00
9,000	99,99	899,91
9,995	99,99	999,40

Test Specification - Price-computing 9,995-kg by 0,005-kg Instrument

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### TECHNICAL SCHEDULE No 6/4D/77

### VARIATION No 1

Pattern: Berkel Weighing Instrument Model ED-M

Submittor: Euroscale Pty Ltd, 19 Evans Street, Burwood, Victoria, 3125

Date of Approval of Variation: 27/6/79

Description of Variants:

- 6. Model ED-L II with weighing unit and mass and price-computing unit housed in a single cabinet and known as Model 560 (Figures 12). The instrument is sealed by a lead-and-wire seal which passes through the drilled heads of two cover-retaining set screws under the platter (Figure 13).
- 7. A prepackaging weighing instrument comprising a Model ED-L II or a Model 560, and a Berkel 3107 self-adhesive label printer (Figure 14); the printer is inhibited from printing when the load is less than loe (2,599 kg instruments) and less than 20e (5,199 kg and 9,995 kg instruments); a sample label is illustrated in Figure 15, but printer may also print one or two dates and a commodity text.

In addition to the semi-automatic tare mechanism, a preselected subtractive tare mechanism with a maximum effect equal to the capacity of the instrument is fitted, tare being selected in increments of 1 scale interval by pressing the appropriate numeral buttons on the keyboard, and then the T button.

The data cable providing the mass, unit-price and price information to the label printer is sealed to the label printer as illustrated in Figure 16 and to the price-computing console as illustrated in Figure 13; alternatively, the serial numbers of the label printer and of the price-computing console are sealed to the weighing unit by the stamping plug on the side of the weighing unit (Figure 17). A cover within the label printer prevents access to the printer circuit boards; it is sealed by a lead-and-wire seal (Figure 16).

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(replaced 21/4/80)

A notice states that the instrument is not to be used on a retail counter.

8. A Model ED-L II weighing instrument, or a Model 560 weighing instrument, with a Berkel 3100 or 3107 ticket printer. Printer Model 3100 is similar to Model 3107 but does not print dates or commodity text. The weighing unit has a semi-automatic subtractive tare device with maximum effect of 200e; tare mass is indicated on both sides of the instrument.

The instrument may be used for prepackaging, or for retail counter use.

For prepackaging, the tickets will be self-adhesive, and will indicate mass, unit price and price.

For retail counter use, the tickets may be self-adhesive or hand held, and may indicate mass, unit price and price, or price only. For price only, the ticket may have the word DOLLARS or the symbol \$ printed before the price; the word DOLLARS or the symbol \$ may be either preprinted on the ticket or printed by the printer.

#### Test Procedure:

As described in Technical Schedule No 6/4D/77.

#### Accuracy Requirements:

The maximum permissible errors are:

 $\pm$  0,5e for loads between zero and 500e;  $\pm$  1e for loads between 501e and 2000e; and  $\pm$  1,5e for loads above 2000e. Page 2

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4/9/79 (replaced 21/4/80)



### TECHNICAL SCHEDULE No 6/4D/77

#### VARIATION No 2

Pattern: Berkel Model ED-M Weighing Instrument

Submittor: Berkel Australia Pty Ltd, 19 Evans Street, Burwood, Victoria, 3125.

1. Description of Variant 9

With an output socket for the connection of peripheral equipment. The socket should be sealed when a peripheral device is not connected.



# NOTIFICATION OF CHANGE CERTIFICATE OF APPROVAL No 6/4D/77 CHANGE No 1

The description of the

Berkel Weighing Instrument Model ED-M

given in Technical Schedule No 6/4D/77 dated 26 May 1978 is altered by changing:

- 1. on page 1 the total price to read \$259,87; and
- 2. in Table 1 the computed price for an indicated weight of 2,599 kg at \$99,99/kg to read \$259,87.



### NOTIFICATION OF CHANGE

#### CERTIFICATE OF APPROVAL No 6/4D/77

#### CHANGE No 2

The description of the

Berkel Weighing Instrument Model ED-M

given in Certificate of Approval No 6/4D/77 and its Technical Schedule is altered by:

A. Certificate of Approval No 6/4D/77 issued on 4/9/79

- 1. In Variant No 7, change 3000 to 3107.
  - 2. In Variant No 8, change 3000 to 3100.

#### B. Technical Schedule No 6/4D/77 issued on 26/5/78

 On page 1 under "Description", in last line of first paragraph, insert "with integral printer" after "console".

#### C. Technical Schedule No 6/4D/77 - Variation No 1 issued on 4/9/79

- 1. Replace pages 1 and 2 with attached pages in which references to ticket printer model 3000 are changed to printer models 3100 and 3107.
- 2. On Figures 14, 15 and 16 change 3000 to 3107.
- 3. On Figure 17, change 560 to ED-L II.



Berkel ED-M

26/5/78



Berke! ED-M



Berkel ED-M - Vendor's Weight Reading Face

FIGURE 6/4D/77 - 3

Berkel

FIGURE 6/4D/77 - 4

NET TOTAL kg \$/kg PRUE 1,150 09,99 *11,4 0,000 00,00 *04,4 0,000 00,00 *01,2 0,21* **,** *14,3	\$ 19 909 19
1,150 09,99 *11,4 0,000 00,00 *04,4 0,000 00,00 *01,2 0,21* **,** *14,3	9 703 9
0,000 00,00 *04. 0,000 00,00 *01,3 0,21* **,** *14,3	69
0,000 00,00 *01,3 0,21* **,** *14,3	
0,21* **,** *14,3	29-
	79

Sample Ticket (actual size)





(a) Covers removed



(b) Covers on - Front panel open

Sealing of Weight-and-price Console (Shield indicated by hatching) 26/5/78

FIGURE 6/4D/77 - 7



Sealing of Output Socket

26/5/78



Sealing of Peripheral Equipment to Output Socket

26/5/78



FIGURE 6/4D/77 - 10



Berkel ED-S

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Berkel ED-LII



Berkel 560



Model 560 Showing Sealing of Instrument and of Data Cable

### FIGURE 6/4D/77 - 14



NE	l kg	PRIC /kg	E \$	PRICI
		<u> </u>	*	

(a) Before printing



(b) After printing

Sample Ticket (actual size)

Sample Ticket Berkel 3000 Printer (actual size) 3107

4/9/79



FIGURE 6/4D/77 - 16

4/9/79



11 7-03

FIGURE 6/4D/77 - 17