



# NATIONAL STANDARDS COMMISSION

## NATIONAL MEASUREMENT (PATTERNS OF INSTRUMENTS) REGULATIONS

### REGULATION 9

#### CERTIFICATE OF APPROVAL No 6/4C/48

This is to certify that an approval for use for trade has been granted in respect of the pattern and variants of the

Mettler Model PE 16 Weighing Instrument

submitted by FSE Scientific  
40 Hilly Street  
Mortlake Point NSW 2137.

#### CONDITIONS OF APPROVAL

This approval is subject to review on or after 1/11/89.  
This approval expires in respect of new instruments on 1/11/90.

Instruments purporting to comply with this approval shall be marked NSC No 6/4C/48.

This approval may be withdrawn if instruments are constructed other than as described in the drawings and specifications lodged with the Commission.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificates Nos S1/0 and/or S2/0, as appropriate.

Signed

Executive Director

#### Descriptive Advice

Pattern: approved 15/10/84

- Mettler model PE 16 class II self-indicating weighing instrument of 16 000 g capacity with a verification scale interval of 1 g.

Variant: approved 15/10/84

1. Other models and capacities as listed in Table 1.

Technical Schedule No 6/4C/48 describes the pattern and variant 1.

Variant: approved 6/7/87

2. Mettler PM series weighing instruments as listed in Table 2.

Technical Schedule No 6/4C/48 Variation No 1 describes variant 2.

Variants: approved 13/11/87

3. PM series weighing instruments in other capacities.
4. PJ series weighing instruments as listed in Table 4.
5. Various PM and PJ series weighing instruments with modified display of the differentiated scale interval.

Technical Schedule No 6/4C/48 Variation No 2 describes variants 3 to 5.

Filing Advice

Certificate of Approval No 6/4C/48 dated 26/10/87 is superseded by this Certificate and may be destroyed. The documentation for this approval now comprises:

Certificate of Approval No 6/4C/48 dated 22/2/88  
Technical Schedule No 6/4C/48 dated 26/3/85 (incl. Table 1)  
Technical Schedule No 6/4C/48 Variation No 1 dated 26/10/87 (incl.  
Tables 2 and 3)  
Technical Schedule No 6/4C/48 Variation No 2 dated 22/2/88 (incl.  
Tables 4 and 5)  
Test Procedure No 6/4C/48 dated 26/3/85  
Figures 1 and 2 dated 26/3/85



# NATIONAL STANDARDS COMMISSION

## TECHNICAL SCHEDULE No 6/4C/48

Pattern: Mettler Model PE16 Weighing Instrument

Submittor: FSE Scientific  
40 Hilly Street  
Mortlake Point NSW 2137

### 1. Description of Pattern

The pattern (Figure 1 and Table 1) is a class II weighing instrument of 16000 g capacity with 1 g verification scale intervals (e). The instrument may be provided with output sockets for the connection of auxiliary and/or peripheral devices.

The right-hand digit (d) is differentiated by hatching. When power is applied a segment check is initiated before zero is indicated.

#### 1.1 Zero and Tare

Zero setting and taring are accomplished by means of a switch bar on the front of the instrument which sets zero to within  $\pm 0,25e$  as indicated by + or - signs. The removal of a tared load from the instrument will result in the value of the tare rounded to the nearest  $0,25e$  being displayed preceded by a minus sign. Tare capacity is up to the maximum capacity of the instrument.

#### 1.2 Levelling

The instrument is supported on three feet, two of which are adjustable. Adjacent to the level indicator is a notice advising that the instrument must be level.

#### 1.3 Markings

The instrument is marked with the following data, together in one location:

Manufacturers name or mark	
Serial number	
NSC approval number	NSC No 6/4C/48
Accuracy class	II
Maximum capacity	Max .... g *
Minimum capacity	Min .... g *
Verification scale interval	e = .... g *
Scale interval	d = .... g *
Maximum subtractive tare	T = -... g

#### 1.4 Verification Provision

Provision is made for a verification mark to be applied.

### 2. Description of Variant 1

Other models and capacities as listed in Table 1.

Figure 2 shows a model PE 6000.

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\* These markings are repeated close to each reading face if not already in that vicinity.

TABLE 1

Model	PE 160	PE 600	PE 1600	PE 6000	PE 16
Maximum capacity	160 g	610 g	1600 g	6100 g	16000 g
Minimum capacity	0.5 g	5 g	5 g	50 g	50 g
Verification scale interval (e)	0.01 g	0.1 g	0.1 g	1 g	1 g
Scale interval (d)	0.001 g	0.01 g	0.01 g	0.1 g	0.1 g

TEST PROCEDURE No 6/4C/48

All load applications to the instrument should be in accordance with the Commission's recommended testing procedure for the elimination of rounding error as set out in Document 104.

The maximum permissible errors are:

- ± 0,5e for loads between 0 and 5000e;
- ± 1,0e for loads between 5001e and 20000e; and
- ± 1,5e for loads above 20000e.

1. Level Sensitivity

When the instrument is tilted so that the bubble in the level indicator moves 2 mm, and zero balance is reset in the tilted position, the instrument should satisfy the accuracy requirements above.

2. Range of Indication

The mass indication should blank or show non-numerical symbols not more than 10 verification scale intervals above the marked maximum capacity, Max.

3. Tare

Place a mass equivalent to the maximum tare capacity plus 11e on the load receptor and attempt to tare; this should not be possible.

Place masses equal to 80% of maximum capacity on the load receptor and operate the tare bar. Then place masses up to 20% of the maximum capacity on the load receptor. The indication of these masses should be within the above accuracy requirements.

4. Load Test

Test loads are to be applied to the instrument in not less than 5 approximately equal steps increasing to maximum capacity, followed by decreasing loads in not less than 5 approximately equal steps to zero load.



6/4C/48  
26/10/87

# NATIONAL STANDARDS COMMISSION

## TECHNICAL SCHEDULE No 6/4C/48

### VARIATION No 1

Pattern: Mettler Model PE 16 Weighing Instrument

Submittor: FSE Scientific  
40 Hilly Street  
Mortlake Point NSW 2137

#### 1. Description of Variant 2

The Mettler PM series weighing instruments (Table 2) are similar to the pattern, with the following additional features:

##### 1.1 Additional Graphic Display

A clockface type display providing a graphic representation of the mass on the platter.

##### 1.2 Adaptable Filtering

Filtering to reduce vibration effects etc. which may be changed by holding the control bar down.

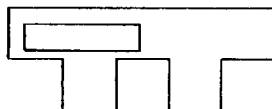
##### 1.3 Secondary Unit

A facility to configure the instrument with a secondary unit, as follows:

- a) kg
- b) lb, oz, ozt, tl, GN, dwt, ct, CM, or k - if the secondary unit is any of these the instrument must be marked "lb ... k (as applicable) not for trade use" or "lb ... k (as applicable) for export use only". The scale interval, verification scale interval, maximum capacity and minimum capacity of the various models when used with these units (and g and kg) are given in Table 2, and shall be marked in the vicinity of the reading face. The markings of the primary units shall be given in grams.
- c) PC: Piece counting - the mass of 10 pieces is set by placing them on the platter and holding the control bar down.
- d) %: Percentage - the mass corresponding to 100% is set by placing the mass on the platter and holding the control bar down.

Note: The approval of functions b, c or d relates to the metrological performance only; inspectors are advised that the use of these functions must comply with the requirements of other statutory authorities.

To prevent unauthorised modifications to the instrument configuration, ensure that the jumper in the plug-in module on the side of the instrument is in the locked position (as shown below), and place a destructible adhesive label over the module to prevent it from being removed without disturbing the label.



Locked



Unlocked

Table 2

Model:	Maximum Capacity			Verification Scale Interval (e)	Scale Interval (d)	Minimum Capacity
	PM4000	PM2000	PM600			
Unit:						
g	4 100.90	2 100.90	610.90	0.1	0.01	0.5
kg	4.100 90	2.100 90	0.610 90	0.000 1	0.000 01	0.000 5
lb	9.040 9	4.631 7	1.346 8	0.001	0.000 1	0.005
oz	144.655	74.107	21.549	0.01	0.001	0.05
ozt	131.847	67.546	19.641	0.01	0.001	0.05
t1	109.540	56.118	16.318	0.01	0.001	0.05
GN	63 287	32 422	9 428	10	1	50
dwt	2 636.94	1 350.91	392.82	0.1	0.01	0.5
ct	20 504.5	10 504.5	3 054.5	1	0.1	5
CM	20 504.5	10 504.5	3 054.5	1	0.1	5
k	20 504.5	10 504.5	3 054.5	1	0.1	5

Note: The values given above are the maximum capacities at blanking; for marking purposes the maximum capacities are:

PM4000 - 4100 g; PM2000 - 2100 g; PM600 - 610 g

Approved Models and Capacities

Table 3

ounce	1 oz = 28.349 523 125 g	1 g = 0.035 273 962 oz
pound	1 lb = 453.592 37 g	1 g = 0.002 204 623 lb
pennyweight	1 dwt = 1.555 173 84 g	1 g = 0.643 014 931 dwt
troy ounce	1 ozt = 31.103 476 8 g	1 g = 0.032 150 747 ozt
grain	1 GN = 0.064 798 91 g	1 g = 15.432 358 35 GN
carat (CM, ct or k)	1 CM = 0.2 g	1 g = 5 CM
tael	1 t1 = 37.437 5 g	1 g = 0.026 711 185 t1

Conversion Factors



# NATIONAL STANDARDS COMMISSION

## TECHNICAL SCHEDULE No 6/4C/48

### VARIATION No 2

Pattern: Mettler Model PE 16 Weighing Instrument.

Submittor: FSE Scientific  
40 Hilly Street  
Mortlake Point NSW 2137.

#### 1. Description of Variants

##### 1.1 Variant 3

PM series weighing instruments in other capacities as listed in Table 4.

Note: The maximum capacities and other values applicable to the secondary units have not been given in Table 4. Should the instrument be fitted with a secondary unit of lb, oz, ozt, tl, GN, dwt, ct, CM, or k the Commission should be contacted and will provide the appropriate values. The values for kg are equivalent to those shown in the Tables.

To ensure that unauthorised modifications to the instrument configuration are prevented the following procedure may be used: (this is an alternative to the method given in Clause 1.3 of Technical Schedule No 6/4C/48 Variation No 1 dated 26/10/87 as the plug-in module is not readily accessible on some instruments)

- With the instrument off (but plugged in and with power applied), depress (and hold down) the TARE/ZERO control. If the instrument then displays "-Conf-" the configuration is not locked and this is unacceptable.

##### 1.2 Variant 4

PJ series weighing instruments as listed in Table 4.

The PJ series instruments are similar to the PM series instruments but with reduced functions, in that the additional graphic display and the secondary unit facility are not fitted.

##### 1.3 Variant 5

Various model PM and PJ series instruments as listed in Table 5.

For these instruments the differentiated scale interval (d) is only displayed for part of the weighing range, as shown in the Table.

Note: For those instruments where the differentiated scale interval (d) is displayed for less than 50 e, the minimum capacity has been given as 50 e rather than 50 d as specified in the Commission's Pattern Approval Specifications.



Table 4

Model	PM6000	PM11	PM16	PJ3000	PJ6000
Maximum capacity (g)	6100	11000	16000	3100	6000
Minimum capacity (g)	5	5	5	0.5	5
Verif. scale int. (e)	1	1	1	0.1	1
Scale interval (d)	0.1	0.1	0.1	0.01	0.1

Approved Models and Capacities for Variants 3 and 4

TABLE 5

Model	PM3000	PM4600	PM6	PM15	PM30	PM34	PJ500	PJ3600	PJ4000	PJ6
Maximum capacity (g)	3100	4100	6100	16000	30000	30000	610	3100	4100	6000
Minimum capacity (g)	5	0.5	50	50	50	5	5	0.5	5	50
Verif. scale int. (e)	0.1	0.1	1	1	1	1	0.1	0.1	0.1	1
Scale interval (d)	0.01	0.01	0.1	0.1	0.1	0.1	0.01	0.01	0.01	0.1
for first .... g	1	600	10	10	10	4000	1	600	1	10

Approved Models and Capacities for Variant 5



# NATIONAL STANDARDS COMMISSION

## NOTIFICATION OF CHANGE

CERTIFICATE OF APPROVAL No 6/4C/48

CHANGE No 1

The following changes are made to the approval documentation for the

Mettler Model PE 16 Weighing Instrument

submitted by FSE Scientific  
40 Hilly Street  
Mortlake Point NSW 2137.

- 1) In Certificate of Approval No 6/4C/48 dated 26/3/85, amend the Filing Advice to include reference to Table 1 dated 24/10/85.
- 2) In Technical Schedule No 6/4C/48 dated 26/3/85, Table 1 on page 2 is replaced by the attached Table 1.

Signed

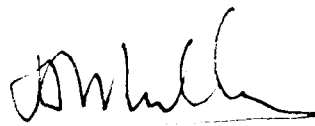
  
for  
Executive Director

TABLE 1

Model	PE 160	PE 600	PE 1600	PE 6000	PE 6	PE 12	PE 16	PE 24
Maximum capacity	160 g	610 g	1600 g	6100 g	6100 g	12000 g	16000 g	24000 g
Minimum capacity	0.5 g	5 g	5 g	50 g	50 g	50 g	50 g	50 g
Verification scale interval (e)	0.01 g	0.1 g	0.1 g	1 g	1 g	1 g	1 g	1 g
Scale interval (d)	0.001 g	0.01 g	0.01 g	0.1 g	1 g	1 g	0.1 g	1 g

NOTE: Models where e and d have the same value may be marked "e = d = ....", and should in addition be marked REZERO BEFORE EACH WEIGHING.

Such instruments do not have the right-hand digit differentiated.



# NATIONAL STANDARDS COMMISSION

6/4C/48  
16/3/88

## NOTIFICATION OF CHANGE

CERTIFICATE OF APPROVAL No 6/4C/48

CHANGE No 2

The following changes are made to the approval documentation for the  
Mettler Model PE 16 Weighing Instrument

submitted by     FSE Scientific  
                    40 Hilly Street  
                    Mortlake Point   NSW   2137.

In Technical Schedules Nos 6/4C/48 Variation No 1 dated 26/10/87 and 6/4C/48  
Variation No 2 dated 22/2/88, the following footnote should be added:

Note: In addition to the markings specified for the PE series (pattern and  
variant 1), the PM and PJ series instruments (variants 2 to 5) shall  
carry the following additional marking:

Special temperature limits

10°C - 30°C

Signed

Executive Director



# NATIONAL STANDARDS COMMISSION

6/4C/48  
20/2/89

## NOTIFICATION OF CHANGE

CERTIFICATE OF APPROVAL No 6/4C/48

### CHANGE No 3

The following changes are made to the approval documentation for the  
Mettler Model PE 16 Weighing Instrument

submitted by FSE Scientific  
40 Hilly Street  
Mortlake Point NSW 2137.

The following values for Minimum Capacity replace the values given in Table 1 dated 24/10/85  
(issued as part of Notification of Change No 1 to Technical Schedule No 6/4C/48):

Model	PE 160	PE 600	PE 1600	PE 6000	PE 16
Minimum capacity	0.05 g	0.5 g	0.5 g	5 g	5 g

Signed

Executive Director



NOTIFICATION OF CHANGE

CERTIFICATE OF APPROVAL No 6/4C/48

CHANGE No 4

The following changes are made to the approval documentation for the  
Mettler Model PE 16 Weighing Instrument

submitted by FSE Pty Limited  
(formerly FSE Scientific)  
Unit 3, 149 Arthur Street  
Homebush NSW 2140.

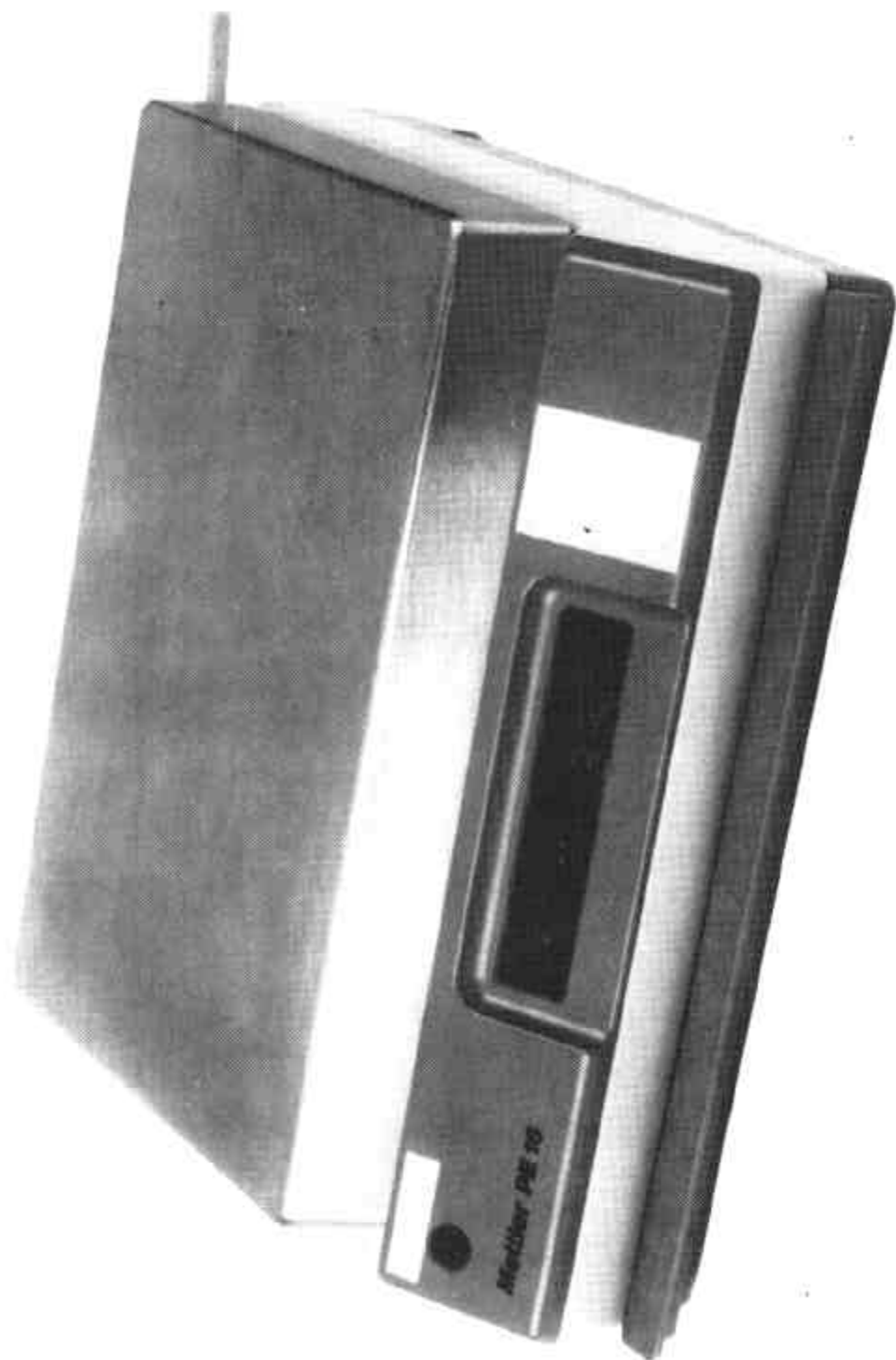
In Technical Schedule No 6/4C/48 Variation No 1 dated 26/10/87, amend  
paragraph 1.3 Secondary Unit as follows:

1. Change the heading to read "1.3 Optional Mass Unit or Display".
2. Change the first line to read "A facility to configure the instrument with another mass unit or display, as follows".
3. In part a); add "CM", so that it now reads "kg, or CM".
4. In part b);
  - (i) Remove the reference to "secondary unit" from the first line and replace with "other mass unit".
  - (ii) Remove "CM" from the first line, and insert "CM" into the text in brackets on the fifth line, so that it now reads "(and g, kg, and CM)".

Signed

Executive Director

FIGURE 6/4C/48 - 1



Mettler Model PE16

FIGURE 6/4C/48 - 2



Mettler Model PE 6000