



**Australian Government**  
**National Measurement**  
**Institute**

Bradfield Road, West Lindfield NSW 2070

## **Certificate of Approval**

### **No 6/9C/296**

Issued by the Chief Metrologist under Regulation 60  
of the  
*National Measurement Regulations 1999*

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

Mettler Toledo Model PBA430-BB30 Weighing Instrument

submitted by           Mettler Toledo Limited  
                                  220 Turner Street  
                                  Port Melbourne VIC 3207

**NOTE:** This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.

This approval has been granted with reference to document NMI R 76, *Non-automatic weighing instruments, Parts 1 and 2*, dated July 2004.

#### **CONDITIONS OF APPROVAL**

This approval becomes subject to review on 1 July 2013, and then every 5 years thereafter.

Instruments purporting to comply with this approval shall be marked with approval number 'NMI 6/9C/296' and only by persons authorised by the submitter.

It is the submitter's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation lodged with the National Measurement Institute (NMI) and with the relevant Certificate of Approval and Technical Schedule. Failure to comply with this Condition may attract penalties under Section 19B of the National Measurement Act and may result in cancellation or withdrawal of the approval, in accordance with document NMI P 106.

The National Measurement Institute reserves the right to examine any instrument or component of an instrument purporting to comply with this approval.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificate No S1/0/A.

This approval shall NOT be used in conjunction with General Certificate No 6B/0.

#### DESCRIPTIVE ADVICE

**Pattern:** approved 2 June 2008

- A Mettler Toledo model PBA430-BB30 multiple range self-indicating weighing instrument of 30 kg maximum capacity.

**Variants:** approved 2 June 2008

1. Certain other models and capacities as listed in Table 1.
2. Certain models known as model BBA4##.
3. With a wireless local area networking interface.
4. The instrument connected to an additional (second) basework, being one of those listed in Table 1.
5. The instrument connected to an additional (second) basework, not being one of those listed in Table 1.
6. Certain baseworks with a compatible approved indicator.

Technical Schedule No 6/9C/296 describes the pattern and variants 1 to 6.

#### FILING ADVICE

The documentation for this approval comprises:

Certificate of Approval No 6/9C/296 dated 3 June 2008  
Technical Schedule No 6/9C/296 dated 3 June 2008 (incl. Test  
Procedure and Tables 1 to 3)  
Figures 1 to 3 dated 3 June 2008

Signed by a person authorised by the Chief Metrologist  
to exercise his powers under Regulation 60 of the  
*National Measurement Regulations 1999.*

A handwritten signature in black ink, consisting of a stylized 'J' followed by a horizontal line and a vertical line, resembling the initials 'JHT'.

## TECHNICAL SCHEDULE No 6/9C/296

**Pattern:** Mettler Toledo Model PBA430-BB30 Weighing Instrument

**Submitter:** Mettler Toledo Limited  
220 Turner Street  
Port Melbourne VIC 3207

### 1. Description of Pattern

A Mettler Toledo model PBA430-BB30 multiple range self-indicating non-automatic weighing instrument (Figure 1) with a verification scale interval ( $e_1$ ) of 0.005 kg for the low range which has a maximum capacity ( $Max_1$ ) of 15 kg and with a verification scale interval ( $e_2$ ) of 0.010 kg for the high range which has a maximum capacity ( $Max_2$ ) of 30 kg.

The changeover between weighing ranges is automatic.

The instrument has a liquid crystal display (LCD) including provision for display of the weight value and for two lines of alphanumeric information/menus.

Instruments are not for trading direct with the public, and are so marked.

Power supply may be either:

- supplied by an internal AC/DC mains adaptor; or
- other DC power source (12 to 24 V); this may include batteries (rechargeable or otherwise) or an external DC power supply.

Instruments may be fitted with output sockets (output interfacing capability) for the connection of auxiliary and/or peripheral devices.

#### 1.1 Basework

The model PBA430-BB30 basework (Figures 1 and 2) has the load receptor directly supported by a single load cell.

This model basework has nominal dimensions of 300 × 400 mm.

#### 1.2 Levelling

The instrument is provided with a level indicator and adjustable feet. Adjacent to the level indicator is a notice stating 'instrument must be level when in use', or similar wording.

Note: Where instruments are not liable to be tilted (i.e. they are installed in a permanently fixed location) the requirement for adjustable feet, level indicator and notice does not apply.

#### 1.3 Load Cells

A single Mettler Toledo model 708-50kg-C3 Ex load cell of 50 kg capacity is used and is mounted as shown in Figure 2.

## **1.4 Indicator**

A Mettler Toledo indicator of the IND4## series, as described in the documentation of approval NMI S480 is used (the model IND429 was used for the pattern as examined).

The indicator may be attached directly to the base or mounted on a column; it may also be located remotely.

The indicator is NOT FOR TRADING DIRECT WITH THE PUBLIC and is so marked.

### **1.4.1 Zero**

Zero may be automatically corrected to within  $\pm 0.25e$  whenever the instrument comes to rest within  $0.5e$  of zero or whenever power is applied (in the case of multi-interval or multiple range configurations,  $e$  in this sentence refers to  $e_1$ ). This feature may, or may not, be enabled.

If the instrument comes to rest outside that range but within the zero setting range, zero may be set by pressing the zero button.

The initial zero-setting device has a nominal range of not more than 20% of the maximum capacity of the instrument.

The instrument has a semi-automatic zero-setting device with a nominal range of not more than 4% of the maximum capacity of the instrument.

### **1.4.2 Tare**

The instrument has provision for subtractive semi-automatic tare, automatic tare and pre-set tare devices each of up to maximum capacity (except for instruments configured as multi-interval or multiple range instruments, in which case the maximum pre-set tare value is  $Max_1$ ).

The values of gross, net and tare are displayed simultaneously in a smaller format to the main mass display (unless the 'Big Dis' display function activated, in which case the net value only is displayed). Pre-set tare values may be stored and recalled, and may be associated with product or item look-up tables.

### **1.4.3 Display Check**

A display check is initiated whenever power is applied.

Software identification information is displayed during the start-up.

## **1.5 Verification/Certification Provision**

Provision is made for the application of a verification/certification mark.

## **1.6 Sealing Provision**

Sealing of the internal components and calibration switch of the indicator is achieved by applying at least one destructible adhesive label over the casing join, typically as shown in Figure 3.

## 1.7 Descriptive Markings and Notices

Instruments carry the following markings:

Manufacturer's mark, or name written in full	Mettler Toledo Limited
Indication of accuracy class	Ⓜ
Pattern approval mark for the instrument	6/9C/296
Maximum capacity (for each range)	<i>Max</i> ..... kg #1
Minimum capacity (for each range)	<i>Min</i> ..... kg #1
Verification scale interval (for each range)	<i>e</i> = ..... kg #1
Maximum subtractive tare	<i>T</i> = - ..... kg #2
Serial number of the instrument	.....
Pattern approval mark for the indicator	.....
Pattern approval mark for other components	..... #3

#1 These markings are also shown near the display of the result if they are not already located there.

#2 This marking is required if *T* is not equal to *Max*.

#3 May be located separately from the other markings.

In addition, instruments carry a notice stating NOT TO BE USED FOR TRADING DIRECT WITH THE PUBLIC, or similar wording.

For multi-interval and multiple range instruments the markings shall be as above, with the exception of the following:

(i) For multi-interval instruments;

Maximum capacity	<i>Max</i> ...../..... kg
Verification scale interval	<i>e</i> = ...../..... kg

(ii) For multiple range instruments, the maximum capacity, minimum capacity and verification scale interval for each range shall be marked, with an indication of the range to which they apply, as shown in the instrument display, e.g. '|<->|1'.

Range	1	2
<i>Max</i>	.... kg	.... kg
<i>Min</i>	.... kg	.... kg
<i>e</i> =	.... kg	.... kg

## 1.8 Data Storage Memory

The indicator may contain memory for the storage of weighing results.

For each weighing, weighing results together with identification including date and time are stored into the storage device.

The use of this feature for trade use is subject to the agreement of the applicable trade measurement authority.

In any case, data from the storage device shall only be used for trade if the format of the output complies with General Supplementary Certificate No S1/0/A.

## 1.9 Interfaces

The indicator may be fitted with interfaces for the connection of auxiliary and/or peripheral devices. Any interfaces shall comply with clause 5.3.6 of document NMI R76 (the basic intent of which is that it shall not be possible to alter weighing results via the interfaces).

Any measurement data output from the instrument or its interfaces shall only be used for trade in compliance with Supplementary Certificate No S1/0/A (in particular in regard to the data and its format).

Indications other than the indications of measured mass (i.e. gross, tare, net, totals) displayed either on the indicator or on an auxiliary or peripheral device, are not for trade use.

Data derived from any analogue output or interface shall not be used for trade use.

Interfaces of the following types may be fitted:

- serial data interfaces: RS232, RS422/RS485, PS2, USB, Ethernet (including wireless networking);
- analogue output; and/or
- digital I/O

## 1.10 Additional Features

The indicator may incorporate additional software packages intended by the manufacturer for particular applications.

Such software may include facilities such as setting of set-points and target values, implementation of 'under/accept/over' checking, counting and 'percentage' display, databases of product information, analysis of weighing results, programming of sequences of operations, etc.

In addition the indicator may have facilities for a number of dialogue (menu access) and function keys to be programmed to perform various functions. Any use of this feature shall be implemented so as not to cause confusion with the normal weighing results.

However this approval relates only to use for trade of the instrument as a non-automatic weighing instrument, in which static weighing (gross or net) of product on the weighing platform is carried out.

In particular, **the approval does not extend to, nor provide any endorsement by the National Measurement Institute, of the additional software or functionality.** The additional functions (other than the indications of measured mass – i.e. gross, tare, net – displayed either on the indicator or on an auxiliary or peripheral device) are not approved for trade use.

**Notes:** The use of the abovementioned features may or may not be appropriate in different situations. The acceptability in any particular situation must be assessed in-situ and may require consultation with the appropriate trade measurement authority. In some situations it may be necessary for a print-out of the weighing result to be produced for the method of operation to be considered acceptable. In such situations General Supplementary Certificate No S1/0/A should be consulted.

## **2. Description of Variants**

### **2.1 Variant 1**

Certain other capacities of multiple range instruments, and also single range instruments, of capacities and with other parameters as listed in Table 1.

### **2.2 Variant 2**

Where a Mettler Toledo indicator of the IND4## series is used (as described in clause **1.4 Indicator** above and in the documentation of approval NMI S480), the instrument may also be known as a model BBA4##... instrument rather than model PBA430 (with 4## corresponding to the particular indicator model). For example the PBA430-BB30 using a model IND439 indicator may be known as a model BBA339-BB30 instrument.

Models known as BBA... typically have the basework and indicator provided as one piece, as shown in Figure 1(a).

### **2.3 Variant 3**

The instrument when using a Mettler Toledo indicator of the IND4## series, being fitted with a wireless local area networking interface.

### **2.4 Variant 4**

The instrument (using a Mettler Toledo IND4## series indicator as described in clause **1.4 Indicator** above) connected to an additional (second) basework being one of those listed in Table 1.

The basework to be used is selected using a key marked with a SCALE symbol and is indicated by a scale symbol indicating either 'SCALE 1' or 'SCALE 2' appearing in the display.

The counting functions of the two platforms may interact, however the weighing and taring functions are independent and do not interact.

Markings shall be provided in relation to each basework.

### **2.5 Variant 5**

The instrument (using a Mettler Toledo IND4## series indicator as described in clause **1.4 Indicator** above) connected to an additional (second) basework, not being one of those listed in Table 1.

In this case the indicator is considered to be a digital indicator approved under Supplementary Certificate of Approval NMI S480 in respect of the additional basework.

Refer to the documentation of approval NMI S480 in regard to this.

## 2.6 Variant 6

Certain baseworks of this approval used with a compatible NMI approved (by Supplementary Certificate) indicator provided the conditions set out below are met.

In addition to the markings specified in clause 1.7 **Descriptive Markings and Notices** above, instruments are marked with the NMI approval number for the indicator used, together in the same location.

The approved baseworks and their limiting characteristics are given in Tables 2 and 3.

The conditions to be met are given below, and include calculations using the following terms:

$E_x$  = Excitation from indicator (V)

$LC\_Sens$  = Load cell sensitivity (mV/V)

$E_{max}$  = Load cell maximum capacity (kg)

Indicator Sensitivity = Minimum sensitivity value per verification scale interval for the indicator ( $\mu$ V)

$e$  = verification scale interval of the instrument (kg). ***In the case of multi-interval or multiple range instruments, any reference to 'e' refers to the smallest verification scale interval (i.e.  $e_1$ ).***

$e_1, e_2, \dots$  = verification scale interval of each range for multiple range instruments (or partial weighing ranges for multi-interval instruments),  $e_1$  refers to the smallest verification interval.

***Max = the maximum capacity of the instrument. This refers to the maximum capacity of the highest range (i.e.  $Max_r$  for multiple range instruments).***

***$Max_r$  = the maximum capacity of the instrument for a multiple range instrument, i.e. the maximum capacity of the highest range.***

***$Max_1, Max_2 \dots$  = the maximum capacity of the various ranges for a multiple range instrument.  $Max_1$  refers to the maximum capacity of the smallest range.***

***$n_{LC}$  = the maximum number of verification intervals for which the load cell or basework is approved (e.g. 3000 for a 'class C3' load cell).***

***DR = dead load return value for the load cell. Note: Many load cells do not have a specified DR value.***

***N = Number of load cells used.***

The conditions are:

- The excitation voltage used is within the range approved for the baseworks.
- The maximum load applied to the basework (live load plus any dead load) does not exceed the load cells maximum capacity, i.e.

$$E_{max} > (Max + platform\ dead\ load)/N$$



- The verification scale interval is not less than the minimum value specified. ***In the case of multi-interval or multiple range instruments, the verification scale interval (e) refers to the smallest verification scale interval (i.e. e<sub>1</sub>).***

$$V_{min} < \frac{e}{\sqrt{N}}$$

- The number of verification scale intervals is less than or equal to the nmax value specified. ***In the case of multi-interval or multiple range instruments, the number of verification scale intervals refers to the largest number in any weighing range or partial weighing range (i.e. the largest of Max<sub>1</sub>/e<sub>1</sub>, Max<sub>2</sub>/e<sub>2</sub> etc).***
- The signal voltage per verification scale interval is not less than the minimum sensitivity value per verification scale interval for the indicator (as specified in the approval documentation for the indicator), i.e.

$$IndicatorSensitivity \leq \frac{1000 \times Ex \times LC \_ Sens \times e}{N \times E_{max}}$$

**Additional requirement for multi-interval operation:**

***In the case of indicators which are configured to form a multi-interval weighing instrument the instrument shall comply with one of the following conditions:***

- (i) ***The smallest verification scale interval (e<sub>1</sub>) shall satisfy the following:***

$$e_1 \geq Max/n_{LC}$$

- (ii) ***Or, the smallest verification scale interval (e<sub>1</sub>) shall satisfy the following:***

$$e_1 \geq 2 \cdot DR \cdot Max/E_{max}$$

***Of course (ii) cannot apply where a value of 'Deadload return' DR is not given.***

***The instrument shall also comply with the following condition:***

$$Max_i / e_{i+1} \geq 500 \text{ (e.g. } Max_1/e_2 \geq 500 \text{ and } Max_2/e_3 \geq 500 \text{ )}$$

**Additional requirement for multiple range operation:**

***In the case of indicators which are configured to form a multiple range weighing instrument the instrument shall comply with one of the following conditions:***

- (i) ***The smallest verification scale interval (e<sub>1</sub>) shall satisfy the following:***

$$e_1 \geq 0.4 Max_r/n_{LC}$$

- (ii) ***Or, the smallest verification scale interval (e<sub>1</sub>) shall satisfy the following:***

$$e_1 \geq DR \cdot Max_r/E_{max}$$

***Of course (ii) cannot apply where a value of 'Deadload return' DR is not given.***

### TEST PROCEDURE

Instruments should be tested in accordance with any relevant tests specified in the Uniform Test Procedures.

#### Maximum Permissible Errors

The maximum permissible errors are specified in Schedule 12 of the *National Measurement Regulations 1999*.

For multiple range instruments with verification scale intervals of  $e_1, e_2 \dots$ , apply  $e_1$  for zero adjustment, and maximum permissible errors apply  $e_1, e_2 \dots$ , as applicable for the load.

TABLE 1

Approved multiple range instruments using Mettler Toledo IND 4## series indicators and Mettler Toledo model 708-xxx-C3 Ex or 709-xxx-C3 Ex load cells, where xxx is the  $E_{max}$  value as shown in the table.

Basework Model	Max <sub>1</sub> /e <sub>1</sub>	Max <sub>2</sub> /e <sub>2</sub>	Min <sub>1</sub> /Min <sub>2</sub>	Maximum Platform Dimensions mm x mm	Load cell $E_{max}$
PBA430-A3	3 kg / 1 g		20 g	240 x 300	11 kg
PBA430-A6	3 kg / 1 g	6 kg / 2 g	20 g / 40 g	240 x 300	11 kg
PBA430-A15	6 kg / 2 g	15 kg / 5 g	40 g / 100 g	240 x 300	22 kg
PBA430-BB30	15 kg / 5 g	30 kg / 10 g	100 g / 200 g	300 x 400	50 kg
PBA430-B30	15 kg / 5 g	30 kg / 10 g	100 g / 200 g	400 x 500	50 kg
PBA430-BB60	30 kg / 10 g	60 kg / 20 g	200 g / 400 g	300 x 400	100 kg
PBA430-B60	30 kg / 10 g	60 kg / 20 g	200 g / 400 g	400 x 500	100 kg
PBA430-B150	60 kg / 20 g	150 kg / 50 g	400 g / 1000 g	400 x 500	200 kg
PBA430-BC60	30 kg / 10 g	60 kg / 20 g	200 g / 400 g	500 x 650	100 kg ‡
PBA430-CC60	30 kg / 10 g	60 kg / 20 g	200 g / 400 g	600 x 800	100 kg ‡
PBA430-BC150	60 kg / 20 g	150 kg / 50 g	400 g / 1000 g	500 x 650	250 kg ‡
PBA430-CC150	60 kg / 20 g	150 kg / 50 g	400 g / 1000 g	600 x 800	250 kg ‡
PBA430-BC300	150 kg / 50 g	300 kg / 100 g	1000 g / 2000 g	500 x 650	500 kg ‡
PBA430-CC300	150 kg / 50 g	300 kg / 100 g	1000 g / 2000 g	600 x 800	500 kg ‡
PBA430-CC600	300 kg / 100 g	600 kg / 200 g	2000 g / 4000 g	600 x 800	1000 kg ‡

‡ Indicates the load cell type is 709-xxx-C3 Ex, otherwise the load cell type is 708-xxx-C3 Ex.

TABLE 2

Instruments/Baseworks using Mettler Toledo model 708-xxxkg-C3 Ex load cells where xxx is the load cell maximum capacity (E<sub>max</sub>) shown in the Table.

Note: The alternative load cell model designation shown (Mettler Toledo Part Number), may also be used.

Instrument PBA430(x)-...	A3	A6	A	BB	B	BB	B	B
Maximum capacity (kg)	3	6	15	30	30	60	60	150
Max platform size (mm x mm)	240 x 300	240 x 300	240 x 300	300 x 400	400 x 500	300 x 400	400 x 500	400 x 500
Max no of verification scale intervals, n <sub>LC</sub>	3000	3000	3000	3000	3000	3000	3000	3000
N, number of load cells	1	1	1	1	1	1	1	1
Alternative load cell model designation	22010200	22010200	22010201	22010202	22010202	22010203	22010203	22010204
Load cell classification	C3	C3	C3	C3	C3	C3	C3	C3
Load cell Max cap, E <sub>max</sub> (kg)	11	11	22	50	50	100	100	200
V <sub>min</sub> of load cell (kg)	0.001	0.001	0.002	0.005	0.005	0.01	0.01	0.02
Load cell sensitivity (mV/V)	2.2	2.2	2.2	2	2	2	2	2
Input impedance (ohm)	1106	1106	1106	1106	1106	1106	1106	1106
Excitation voltage (max) (V)	15	15	15	15	15	15	15	15
Cable length (m) (*)	2	2	2	2	2	2	2	2
No. of leads (plus shield)	6	6	6	6	6	6	6	6

(#) The cable length supplied with the basework shall not be shortened

TABLE 3

Instruments/Baseworks using Mettler Toledo model 709-xxxkg-C3 Ex load cells  
where xxx is the load cell maximum capacity (E<sub>max</sub>) shown in the Table.

Note: The alternative load cell model designation shown (Mettler Toledo Part Number), may also be used.

Instrument PBA430(x)-...	BC	CC	BC	CC	BC	CC	BC	CC	CC
Maximum capacity (kg)	60	60	150	150	300	300	300	300	600
Max platform size (mm x mm)	500 x 650	600 x 800	500 x 650	600 x 800	500 x 650	600 x 800	500 x 650	600 x 800	600 x 800
Max no of verification scale intervals, n <sub>LC</sub>	3000	3000	3000	3000	3000	3000	3000	3000	3000
N, number of load cells	1	1	1	1	1	1	1	1	1
Alternative load cell model designation	22010205	22010205	22010206	22010206	22010207	22010207	22010207	22010207	22010208
Load cell classification	C3	C3	C3	C3	C3	C3	C3	C3	C3
Load cell Max cap, E <sub>max</sub> (kg)	100	100	250	250	500	500	500	500	1000
V <sub>min</sub> of load cell (kg)	0.008	0.008	0.02	0.02	0.04	0.04	0.04	0.04	0.08
Load cell sensitivity (mV/V)	2	2	2	2	2	2	2	2	2
Input impedance (ohm)	1106	1106	1106	1106	1106	1106	1106	1106	1106
Excitation voltage (max) (V)	15	15	15	15	15	15	15	15	15
Cable length (m) (*)	2	2	2	2	2	2	2	2	2
No. of leads (plus shield)	6	6	6	6	6	6	6	6	6

(#) The cable length supplied with the basework shall not be shortened

FIGURE 6/9C/296 – 1

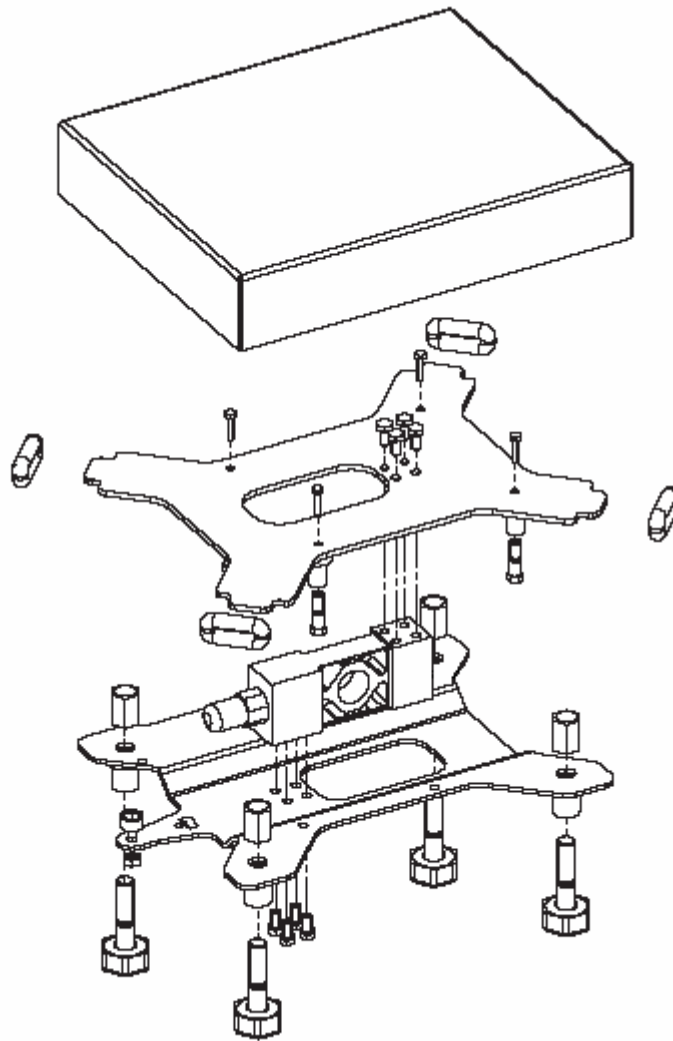


(a) Mettler Toledo Model PBA430-BB30 Instrument

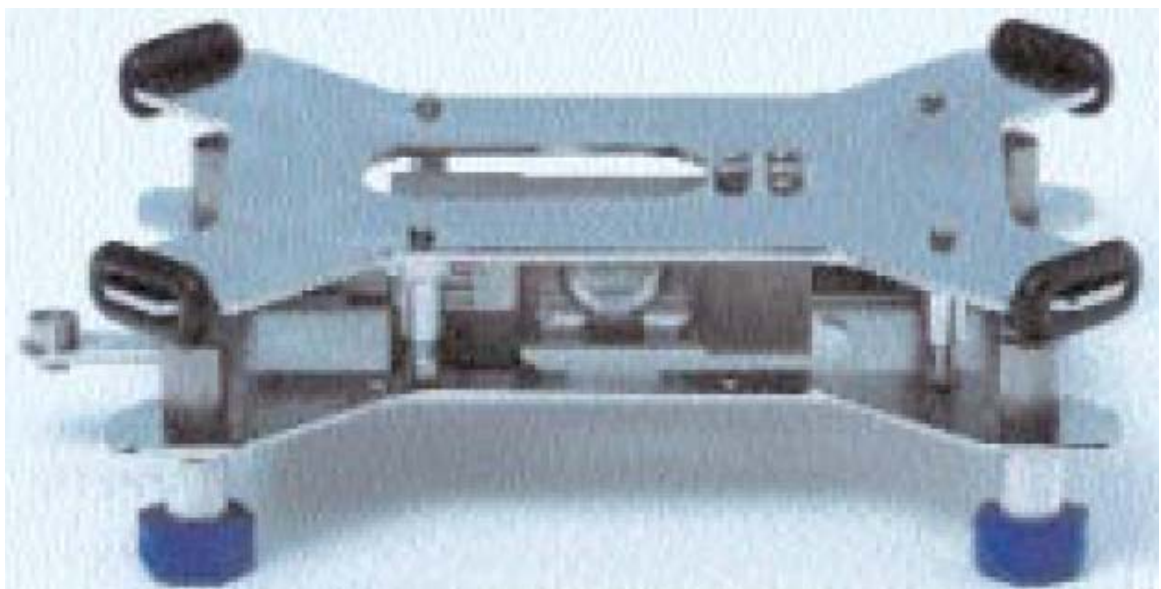


(b) Mettler Toledo Model PBA430 Baseworks

FIGURE 6/9C/296 – 2

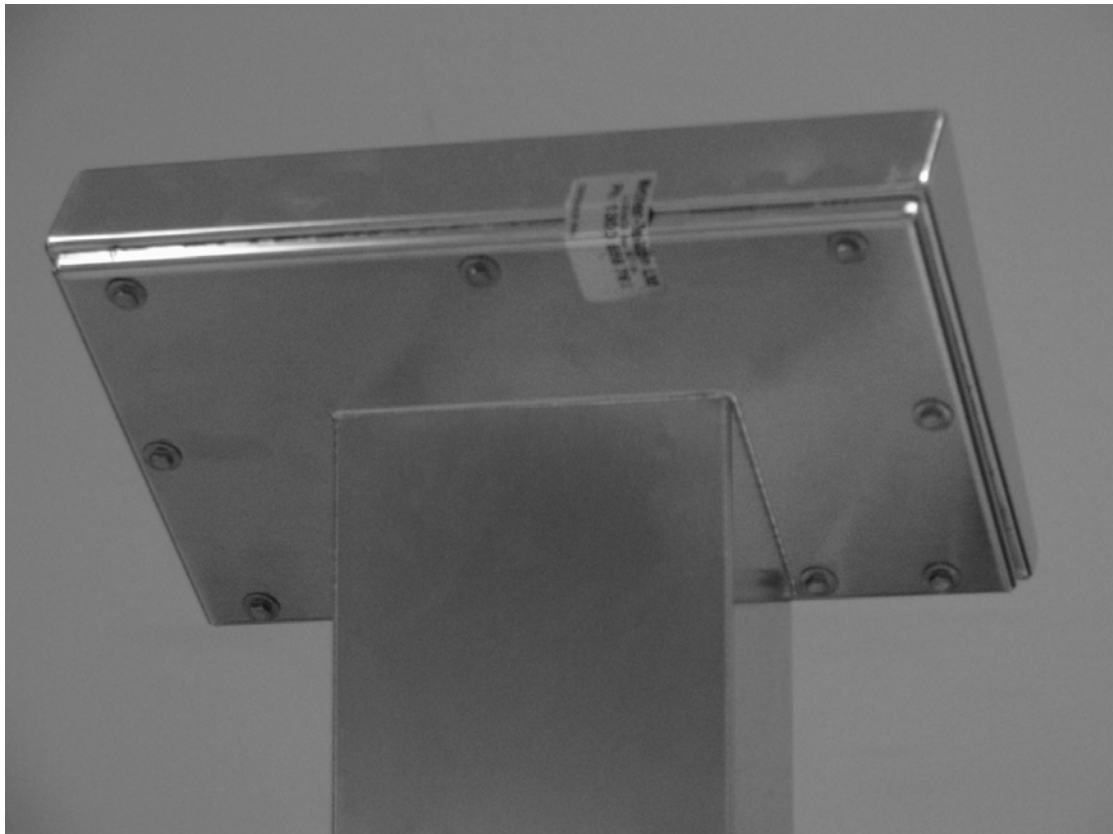


(a) Mettler Toledo Model PBA430 Basework (exploded view)



(b) Mettler Toledo Model PBA430 Basework (platter removed)

FIGURE 6/9C/296 – 3



Typical Sealing Arrangement