Australian Government
Department of Industry and Science

National Measurement Institute

Certificate of Approval

NMI 6/4C/298

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 instruments herein described.

Wedderburn Model WS207 Weighing Instrument

submitted by W W Wedderburn Pty Ltd
101 Williamson Road
Ingleburn NSW 2565

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.

This approval becomes subject to review on 1/09/20, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variants 1 to 9 approved – certificate issued	7/08/15

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 6/4C/298' and only by persons authorised by the submittor.

It is the submittor'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.

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

The use of substitute approved load cells (i.e. through the application of General Certificate of Approval No 6B/0) is not approved.

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

Dr A Rawlinson

TECHNICAL SCHEDULE No 6/4C/298

1. Description of Pattern approved on 7/08/15

A Wedderburn model WS207 class (III) single interval self-indicating non-automatic weighing instrument (Figure 1a) of 60 kg maximum capacity with a verification scale interval of 0.02 kg. For identification the instrument is to be known as a WS207 with its associated basework capacity identifier code i.e. WS207PXX60K.

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

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

1.1 Basework

The Wedderburn model PXX60K basework (Figure 1b) has the load receptor directly supported by a single load cell. The load receptor has a nominal dimension of 400 mm × 400 mm.

1.2 Load cell

A Keli Electric model UDB C3 load cell of 100 kg maximum capacity is used.

1.3 Indicator

A Wedderburn model WDI-702 digital indicator having a stainless steel enclosure is used. The indicator is described in the documentation of approval NMI S664.

The indicator may be mounted on a column (Figures 1a and 2a) or attached to the platform (Figure 5) or it may also be located remotely.

1.4 Zero

A zero-tracking device may be fitted.

The initial zero-setting device of the pattern 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.

1.5 Tare

A semi-automatic subtractive tare device of up to maximum capacity may be fitted.

1.6 Display Check

A display check is initiated whenever power is applied.

1.7 Power Supply

Power for the Wedderburn Model WS207 instruments may be supplied by:

- an 12 V AC/DC mains adaptor; and/or
- an internal 7.4 V Li-ion rechargeable battery.

Note: The AC/DC mains adaptor supplied for the instrument was GEO model GS2S-012-1201000L switch mode power supply (output 12 V DC, 1 A) – the submittor should be consulted regarding the acceptability of alternative power supply units.

1.8 Additional Features

The indicator also has certain additional functions (e.g. counting, animal weighing, checking functions). The additional functions are not approved for trade use.

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 R 76 (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 NMI General Supplementary Certificate No S1/0B (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.

Instruments may be fitted with one RS-232 serial data interface.

1.10 Levelling

The instrument is provided with adjustable feet and adjacent to the level indicator is a notice advising that 'Instrument must be level when in use' (or similar wording).

1.11 Software

The software is designated u 1-xx (where xx refers to the identification of non-legally relevant software).

The software version and number can be seen in the switch-on display sequence (when the power is first applied to the instrument).

1.12 Descriptive Markings and Notices

Instruments carry the following markings:

Manufacturer's mark, or name written in full	WEDDERBURN	
Indication of accuracy class	(III)	
Pattern approval number for the instrument	NMI 6/9C/298	
Maximum capacity	*Max* ...../..... g or kg	#1
Minimum capacity	*Min* ..... g or kg	#1
Verification scale interval	*e* = .../..... g or kg	#1
Maximum subtractive tare	*T* = - ..... g or kg	#2
Serial number of the instrument	…….	

#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*.

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

1.13 Verification Provision

Provision is made for the application of a verification mark.

1.14 Sealing Provision

Provision is made for access to the calibration switch within the instrument to be sealed using destructible labels placed over the span switch access hole and/or opposite sides of a join in the instrument housing in Figures 2a & 2b.

2. Description of Variant 1 **approved on 7/08/15**

The Wedderburn WS207PXX#K series instruments in certain other single interval capacities as listed in Table 1 (the pattern is shown in **bold**):

Type: Wedderburn WS207PXX#K series as listed below, where # in the model number represents the maximum capacity in kilograms, e.g. the pattern model WS207 is of 60 kg capacity.

TABLE 1 – Approved WS207PXX#K series single interval instruments (Variant 1)

Model	Maximum Capacity (*Max*)	Verification Scale Interval (*e*)	Platform Size	Keli Electric Model UDB C3 Load Cell Maximum Capacity E_{max}
#=6K	6 kg	0.002 kg	400 × 400 mm	15 kg
#=15K	15 kg	0.005 kg	400 × 400 mm	20, 30, 35 kg
#=30K	30 kg	0.01 kg	400 × 400 mm	50, 60 kg
#=60K	**60 kg**	**0.02 kg**	**400 × 400 mm**	**100, 150 kg**
#=150K	150 kg	0.05 kg	400 × 400 mm	200, 300 kg
#=300K	300 kg	0.1 kg	400 × 400 mm	500 kg

3. Description of Variant 2 **approved on 7/08/15**

The Wedderburn WS207SXX#K series instruments (Figure 3a) which are similar to the pattern but use a SXX#K basework (Figure 3b) of which uses a Zemic model L6D C3 load cell in certain single interval capacities as listed in Table 2.

TABLE 2 – Approved WS207SXX#K series single interval instruments (Variant 2)

Model	Maximum Capacity (*Max*)	Verification Scale Interval (*e*)	Platform Size	Zemic Model L6D C3 Load Cell Maximum Capacity E_{max}
#=6K	6 kg	0.002 kg	300 × 300 mm	10 kg
#=15K	15 kg	0.005 kg	300 × 300 mm	20, 30 kg
#=30K	30 kg	0.01 kg	300 × 300 mm	40, 50 kg

4. Description of Variant 3 **approved on 7/08/15**

The Wedderburn WS207SXX#K series instruments in certain multiple range capacities as listed in Table 3.

A semi-automatic subtractive tare device of up to the highest maximum capacity Max_2 shown in the Table 3 may be fitted.

TABLE 3 – Approved WS207SXX#K series multiple range instruments (Variant 3)

Model	Maximum Capacity (Max_1/Max_2)	Verification Scale Interval (e_1/e_2)	Platform Size	Zemic Model L6D C3 Load Cell Maximum Capacity
#=6K	3 / 6 kg	0.001 / 0.002 kg	300 × 300 mm	10 kg
#=15K	6 / 15 kg	0.002 / 0.005 kg	300 × 300 mm	20 kg
#=30K	15 / 30 kg	0.005 / 0.01 kg	300 × 300 mm	40, 50 kg

4.1 Markings

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, e.g.

Range	|←1→|	|←2→|
Max	…. kg	…. kg
Min	…. kg	…. kg
e =	…. kg	…. kg

5. Description of Variant 4 **approved on 7/08/15**

The Wedderburn Model WS207PMS#K series instruments (Figure 4a) which are similar to the pattern but use a PMS#K basework (Figure 4b) of which uses a Zemic model L6G C3 load cell in certain single interval capacities as listed in Table 4.

TABLE 4 – Approved WS207PMS#K series single interval instruments (Variant 4)

Model	Maximum Capacity (*Max*)	Verification Scale Interval (*e*)	Platform Size	Zemic Model L6G C3 Load Cell Maximum Capacity
#=30K	30 kg	0.01 kg	400 × 500 mm	50 kg
#=60K	60 kg	0.02 kg	400 × 500 mm	100, 150 kg
#=150K	150 kg	0.05 kg	400 × 500 mm	200, 250, 300 kg
#=300K	300 kg	0.1 kg	400 × 500 mm	500, 600 kg

6. Description of Variant 5 approved on 7/08/15

The Wedderburn WS207PMS#K series instruments in certain multiple range capacities as listed in Table 5.

A semi-automatic subtractive tare device of up to the highest maximum capacity Max_2 shown in the Table 5 may be fitted.

TABLE 5 – Approved WS207PMS#K series multiple range instruments (Variant 5)

Model	Maximum Capacity (Max_1/Max_2)	Verification Scale Interval (e_1/e_2)	Platform Size	Zemic Model L6G C3 Load Cell Maximum Capacity
#=30K	15 / 30 kg	0.005 / 0.01 kg	400 × 500 mm	50 kg
#=60K	30 / 60 kg	0.01 / 0.02 kg	400 × 500 mm	100 kg
#=150K	60 / 150 kg	0.02 / 0.05 kg	400 × 500 mm	200 kg
#=300K	150 / 300 kg	0.05 / 0.1 kg	400 × 500 mm	500, 600 kg

6.1 Markings

Refer to clause 4.1 for marking of multiple range instruments.

7. Description of Variant 6 approved on 7/08/15

The Wedderburn WS207TMS#K series instruments (Figure 5a) which are similar to the pattern but use a TMS#K basework (Figure 5b) of which uses a Zemic model L6E C3 load cell in certain single interval capacities as listed in Table 6.

TABLE 6 – Approved WS207TMS#K series single interval instruments (Variant 6)

Model	Maximum Capacity (*Max*)	Verification Scale Interval (*e*)	Platform Size	Zemic Model L6E C3 Load Cell Maximum Capacity
#=30K	30 kg	0.01 kg	300 × 400 mm	50, 60 kg
#=60K	60 kg	0.02 kg	300 × 400 mm	80, 100 kg
#=150K	150 kg	0.05 kg	300 × 400 mm	200, 300 kg

8. Description of Variant 7 approved on 7/08/15

The Wedderburn WS207TMS#K series instruments in certain multiple range capacities as listed in Table 7.

A semi-automatic subtractive tare device of up to the highest maximum capacity Max_2 shown in the Table 7 may be fitted.

TABLE 7 – Approved WS207TMS#K series multiple range instruments (Variant 7)

Model	Maximum Capacity (Max_1/Max_2)	Verification Scale Interval (e_1/e_2)	Platform Size	Zemic Model L6E C3 Load Cell Maximum Capacity
#=30K	15 / 30 kg	0.005 / 0.01 kg	300 × 400 mm	50 kg
#=60K	30 / 60 kg	0.01 / 0.02 kg	300 × 400 mm	80, 100 kg
#=150K	60 / 150 kg	0.02 / 0.05 kg	300 × 400 mm	200 kg

8.1 Markings

Refer to clause 4.1 for marking of multiple range instruments.

9. Description of Variant 8 approved on 7/08/15

Similar to the pattern and variants 1 to 7, but having a Wedderburn model WDI-702 digital indicator with an ABS plastic enclosure. The model WDI-702 digital indicator is described in approval NMI S664.

10. Description of Variant 9 approved on 7/08/15

Any model basework of this approval, used with a compatible approved (by Supplementary Certificate) indicator provided the conditions set out below are met. These baseworks and their limiting characteristics are given in Tables 1 to 7.

The resulting instrument may be single range, multiple range, or multi-interval (according to the indicator used), provided that the conditions given are met.

Characteristics of the load cells used are needed to determine that the required conditions are met. These characteristics are given in Tables 8 to 11.

In addition to the markings specified in clause **1.12 Descriptive Markings and Notices**, instruments are marked with the NMI approval number for the indicator used, together in the same location. Where the resulting instrument is a multiple range instrument, appropriate markings regarding the ranges and scale intervals shall be provided in accordance with the Supplementary Certificate for the indicator.

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

Ex = 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 (µV)

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, … = 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 … = the maximum capacity of the various ranges for a multiple range instrument. Max1 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.

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 cell maximum capacity.
- 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 refers to the smallest verification scale interval (i.e. e_1).***
- 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_1/e_1, Max_2/e_2 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.

  Indicator Sensitivity ≤ 1000 × Ex × LC_Sens × e / E_{max}

<u>Additional requirement for multi-interval operation:</u>

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_1) shall satisfy the following:

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

(ii) Or, the smallest verification scale interval (e_1) shall satisfy the following:

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

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

<u>Additional requirement for multiple range operation:</u>

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_1) shall satisfy the following:

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

(ii) Or, the smallest verification scale interval (e_1) shall satisfy the following:

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

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

TABLE 8 – Keli Electric UDB Load Cell Data (used in PXX baseworks)

Load cell used	UDB										
Load cell max capacity, Emax (kg)	15	20	30	35	50	60	100	150	200	300	500
Max number of verification scale intervals (n_{LC})	3000										
Min value of verification scale interval (**Vmin** of load cell)(kg)	0.001	0.002	0.002	0.002	0.004	0.004	0.008	0.008	0.02	0.02	0.04
Load cell sensitivity at Emax	2 mV/V										
Input impedance	404 Ω										
Excitation voltage	18 V (max.)										
Load cell cable length	1.8 metres (approx.) (*)										
Number of leads	4 (plus shield)										

(*) *Cable length attached to load cell supplied with basework shall not be lengthened or shortened.*

TABLE 9 – Zemic L6D Load Cell Data (used in SXX baseworks)

Load cell used	L6D				
Load cell max capacity, Emax (kg)	10	20	30	40	50
Max number of verification scale intervals (n_{LC})	3000				
Min value of verification scale interval (**Vmin** of load cell)(kg)	0.001	0.002	0.003	0.004	0.005
Load cell sensitivity at Emax	2 mV/V				
Input impedance	409 Ω				
Excitation voltage	18 V (max.)				
Load cell cable length	4 metres (approx.) (*)				
Number of leads	4 (plus shield)				

TABLE 10 – Zemic L6G Load Cell Data (used in PMS baseworks)

Load cell used	L6G							
Load cell max capacity, Emax (kg)	50	100	150	200	250	300	500	600
Max number of verification scale intervals (n_{LC})	3000							
Min value of verification scale interval (**Vmin** of load cell) (kg)	0.0042	0.0083	0.0125	0.0167	0.0208	0.025	0.0417	0.05
Load cell sensitivity at Emax	2 mV/V							
Input impedance	409 Ω							
Excitation voltage	18 V (max.)							
Load cell cable length	3 metres (approx.) (*)							
Number of leads	6 (plus shield)							

(*) *Cable length attached to load cell supplied with basework shall not be lengthened or shortened.*

TABLE 11 – Zemic L6E Load Cell Data (used in TMS baseworks)

Load cell used	L6E					
Load cell max capacity, Emax (kg)	50	60	80	100	200	300
Max number of verification scale intervals (n_{LC})	3000					
Min value of verification scale interval (**V_{min}** of load cell) (kg)	0.005	0.006	0.008	0.01	0.02	0.03
Load cell sensitivity at Emax	2 mV/V					
Input impedance	406 Ω					
Excitation voltage	18 V (max.)					
Load cell cable length	2 metres (approx.) (*)					
Number of leads	4 (plus shield)					

(*) Cable length attached to load cell supplied with basework shall not be lengthened or shortened.

TEST PROCEDURE

Instruments shall be tested in accordance with any relevant tests specified in the National Instrument Test Procedures.

The instrument shall not be adjusted to anything other than as close as practical to zero error, even when these values are within the maximum permissible errors.

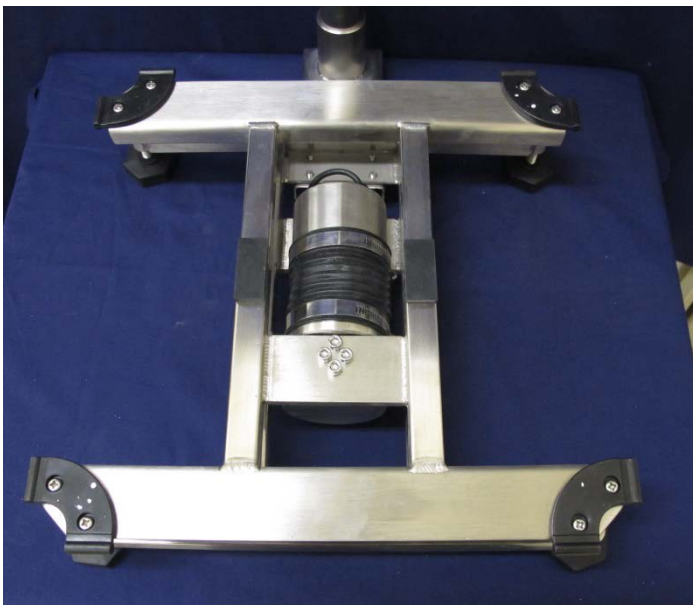
Maximum Permissible Errors

The maximum permissible errors are specified in the *National Trade Measurement Regulations 2009*.

For multi-interval and multiple range instruments with verification scale intervals of e_1, e_2 …, apply e_1 for zero adjustment, and maximum permissible errors apply e_1, e_2 …, as applicable for the load.

FIGURE 6/4C/298 – 1

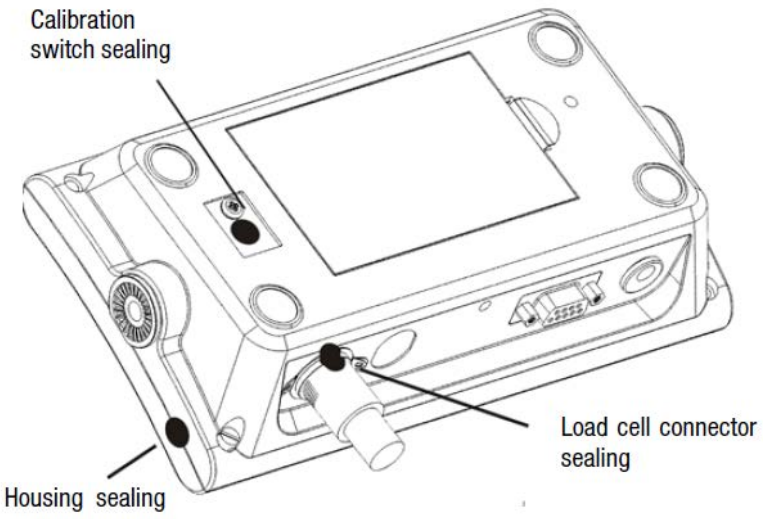
(a) Wedderburn Model WS207PXX#K Weighing Instrument (Pattern & Variant 1)



(b) Wedderburn Model PXX Basework Mounting Frame (Pattern & variant 1)

FIGURE 6/4C/298 – 2

(a) Typical Sealing of Wedderburn Model WDI-702 Stainless Steel Indicator (Pattern & variants)

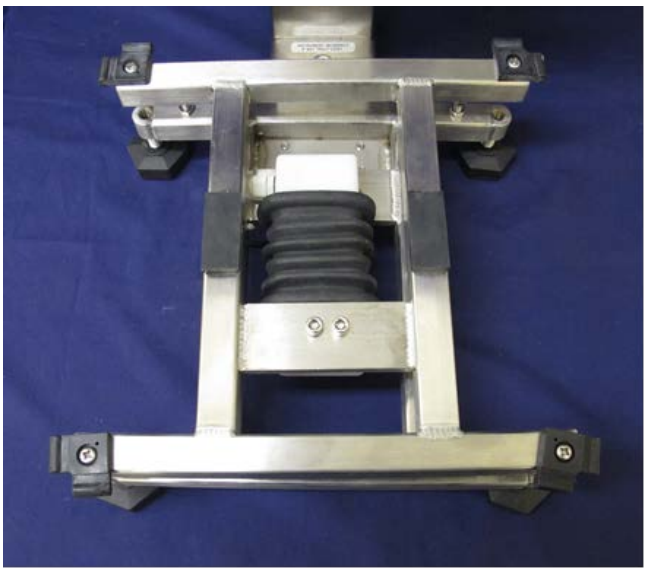


(b) Typical Sealing of Wedderburn Model WDI-702 ABS Indicator (Certain variants only)

Showing Typical Indicator Sealing

FIGURE 6/4C/298 – 3

(a) Wedderburn Model WS207SXX#K Weighing Instrument (Variants 2 & 3)



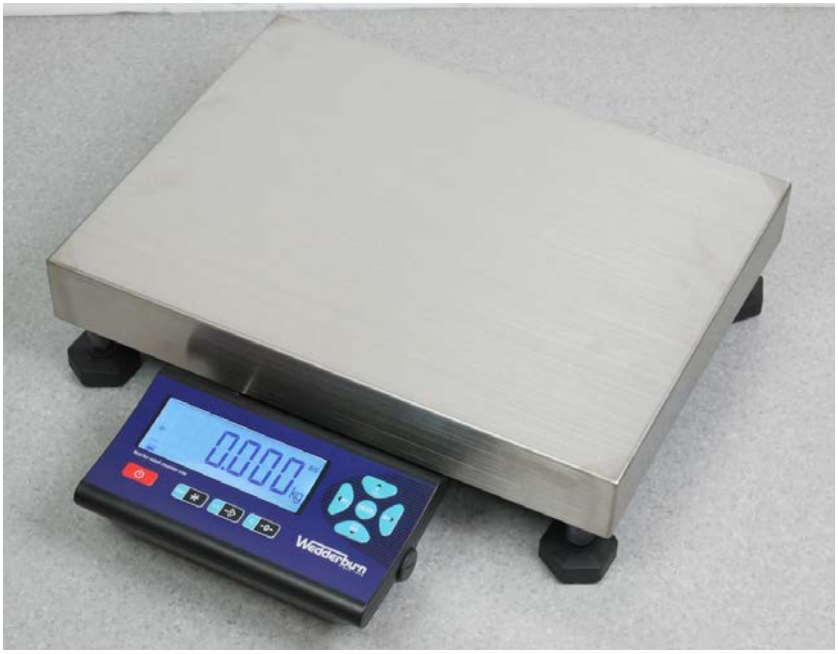
(b) Wedderburn Model SXX Basework Mounting Frame (Variants 2 & 3)

FIGURE 6/4C/298 – 4

(a) Wedderburn Model WS207PMS#K Weighing Instrument (Variants 4 & 5)

(b) Wedderburn Model PMS Basework Mounting Frame (Variants 4 & 5)

FIGURE 6/4C/298 – 5



(a) Wedderburn Model WS207TMS#K weighing Instrument (Variants 6 & 7)

(b) Wedderburn Model TMS Basework Mounting Frame (Variants 6 & 7)

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