Australian Government
Department of Industry, Innovation and Science

National Measurement Institute

Interim Provisional Certificate of Approval NMI P6/14H/6

VALID FOR VERIFICATION PURPOSES UNTIL 1 APRIL 2016

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.

Mettler Toledo Model 7260 Train Weighing-in-motion 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 106, Automatic Rail Weighbridges, dated July 2004.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern and variants 1 & 2 provisionally approved – interim certificate issued	1/10/15

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI P6/14H/6' and only by persons authorised by the submittor. (Note: The 'P' in the approval number may be a temporary marking.)

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 values of the performance criteria (maximum number of scale intervals etc.) applicable to an instrument incorporating the pattern approved herein shall be within the limits specified herein and in any approval documentation for the other components.

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

Special

For this type of instrument, the ability to perform (and continue to perform) within specified maximum permissible errors can depend substantially on characteristics of the rail alignment and the stability of the material on which the rail sleepers rest (whether ballast, concrete footings or some other arrangement). However the National Measurement Institute is unable to clearly define particular requirements for material on which the rail sleepers shall rest.

It is the responsibility of the submittor to exercise control over any installation to ensure compliance with this approval and to ensure performance (and continued performance) within the appropriate maximum permissible errors.

The ability to perform within specified maximum permissible errors can also depend on characteristics of the rail vehicles being weighed (for example wagons with 'flat wheels', rubbing brakes or stiff couplings can be detrimental to performance). Consequently rail operators have a responsibility to ensure adequate maintenance of the rail vehicles (otherwise maximum permissible errors may not be able to be met).

In the event of unsatisfactory performance, allowable accuracy classes or modes of operation may need to be altered, additional conditions imposed or this approval may be withdrawn.

Special Conditions of Approval: (Provisional Approval)

This approval is limited to five (5) sites only, the locations of which may be obtained from the National Measurement Institute. The submittor shall advise NMI in writing of the proposed location or serial number of each instrument prior to it being initially verified.

The approval will remain provisional pending completion of satisfactory testing and evaluation.

The submittor shall provide NMI with copies of test results from the initial verification and all subsequent tests.

In the event of unsatisfactory performance the approval may be cancelled (or altered).

The submittor shall implement such modifications as required by NMI. In the event that such modifications (if any are required by NMI) are not made to the satisfaction of NMI, this approval may be withdrawn.

1. Description of Pattern provisionally approved on 1/10/15

A Mettler Toledo model 7260 (also known as a Railmate) weighing instrument, for the determination of bogie/axle weights, and hence the weight of each wagon and the total weight of a train, when weighed in motion. The instrument is approved for classes 0.5, 1 or 2 wagon weighing and classes 0.2, 0.5, 1 or 2 train weighing, with a maximum wagon weight of up to 120 t, a minimum wagon weight of at least 11 t, and a scale interval of at least 50 kg, over a speed range of 0.5 to 9 km/h.

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

1.1 Weighing Platform

The weighing platform (steel deck) supports a short section of rail track on four load cells to weigh each bogie. The platform is fitted with stays to restrict both longitudinal and transverse movement.

1.2 Load Cells

Four Mettler Toledo model PDX load cells of 50 000 kg maximum capacity (accuracy class C3) are used. The load cells are also described in the documentation of approval No NMI S529.

1.3 Indicator/Controller

A Mettler Toledo model IND780 indicator is used. This indicator is also described in the documentation of approval No NMI S502.

Systems shall be constructed to be within the approved parameters of the IND780 indicator (NMI No S502) and the load cells used (although NMI General Certificate 6B/0 does not apply to this type of instrument, calculations similar to those included in that certificate shall be carried out to determine this).

The model IND780 indicator supplies weight data to the Mettler Toledo model IND9R86 controller. The controller uses weight data from the IND780 indicator, together with signals from track switches, and information from automatic vehicle identification systems (tag readers), to group axle weight data and determine wagon weights, total train weights and to determine unweighed vehicles (e.g. locomotives).

The model IND9R86 controller is connected to a printer for the output of measurement reports. In addition the controller may be connected to a computer system that may provide for remote downloading of train weighing results and entry of data such as train identification. The computer system, or the IND9R86 controller may be connected to a printer for the output of measurement reports.

1.4 Printout

The wagon identification, sequence number, speed, individual wagon weight and total train weight are printed.

For incorrectly weighed wagons (e.g. outside approved speed range, above maximum wagon weight or below minimum wagon weight) wagon identification details are printed together with a weighing status code which indicates the nature of the issue (e.g. Weight Code = 2 indicates 'TOO FAST', 4 indicates 'OVER WEIGHT'), however the wagon weight is not printed. The printout shall include a legend indicating the meaning of the weighing status codes.

Note: Weight Codes of 0 (meaning 'OK Speed') and 1 (meaning 'MARGINAL SPEED') indicate acceptable weighing, for which the wagon weight may be printed.

Other information may also be printed but locomotive weights will not be printed.

As the total train weight printed excludes any incorrectly weighed wagons, the total shall be printed with a message "TOTAL Weight: The total weight of the train excludes the weights of incorrectly weighed wagons" or similar wording.

1.5 Track Switches

(*) For items marked (*) below, 'Compatible and Equivalent' equipment may be used. 'Compatible and Equivalent' refers to equipment of the same or better specifications, requiring no changes to software for satisfactory operation of the complete system including all checking facilities.

Up to eight Tiefenbach model 2N59-1R-200-45 (*) track switches are installed and operated by the wheels of the rail vehicles. The operating sequence provides the model IND9R86 controller with logic signals to initiate the system, identify and distinguish locomotives from wagons, monitor train speed, make speed information available to the train driver, and determine train roll-back. Information regarding weighing status may be supplied to the train driver by means such as light signals.

1.6 Roll Back Detection

The IND9R86 controller will maintain proper sequencing when a roll back of rail wagons occurs. There is no action required by the operator for the normal weighing operation to continue if the train reverses direction. The axle counts will simply decrement while reversing and increment while the train move in the weighing direction at the start of weighing. The rail wagon will not be re-weighed if it passes over the scale in the reverse direction, then over the scale again in the weighing direction.

1.7 Specifications

In-situ performance of the instrument will depend on site conditions and train configuration. It may therefore be necessary following in-situ testing (and in the light of results obtained) to restrict the range of operation in ways such as:

- Limiting the maximum and/or minimum wagon weights.
- Limiting the allowable speed range(s).
- A combination of both the above.

Such restrictions shall be marked on the nameplate of the instrument and where operation occurs outside the acceptable range(s), weight values should not be shown and an error message should appear (similar to the current overspeed arrangement).

Instruments may have differing specifications as described above, but shall be within the limits shown below:

Accuracy class train weighing	0.2, 0.5, 1 or 2
Accuracy class wagon weighing	0.5, 1 or 2
Maximum capacity	60 t per bogie
Minimum capacity	5.5 t per bogie
Scale interval	50 kg or 100 kg
Maximum wagon weight	Number of bogies × 60 t (or less)
Minimum wagon weight	Number of wheels × 5.5 t (or more)
Maximum operating speed	9 km/h or less
Minimum operating speed	0.1 km/h or more

Note: The system may operate down to very low speeds (effectively stationary). However a minimum operating speed is indicated to provide a practical value for the conduct of performance tests.

1.8 Descriptive Markings

Instruments bear the following basic markings at each location having a weight indication or printing device (the values given are provided as an example only):

Manufacturer's name or mark	…..
Importer's name or mark	…..
Model designation	…..
Serial number of the instrument	…..
Pattern approval mark	NSC No P6/14H/6
Accuracy class	
Train weighing	0.2
Wagon weighing	1
Maximum capacity	Max (bogie) = 60 t
Minimum capacity	Min (bogie) = 5.5 t
Scale interval	d = 50 kg
Maximum wagon weight	Number of bogies 60 t
Minimum wagon weight	Number of bogies 5.5 t
Maximum operating speed	v max = 9 km/h
Minimum operating speed	v min = 0.5 km/h
Maximum number of wagons per train (*)	n max .....
(*)	If less than 60 wagons

The markings shall reflect details for which the particular installation has been verified. The maximum and minimum wagon weights and the maximum and minimum operating speeds may vary from those shown in the specifications (clause 1.7) but shall be within the limits specified there. For example, the maximum wagon weight will be related to the heaviest reference wagon used; the National Instrument Test Procedures should be consulted in regard to this.

Note 1: It is acceptable for more complex sets of markings to be provided. This may be necessary where (for example) it was necessary following in-situ testing to restrict operation to one speed range for wagon weighing and another speed range for train weighing. Such arrangements shall be clearly set out in the markings provided.

Note 2: Where an installation is only to be used with wagons of a particular configuration (e.g. all with 4 axles) the maximum and minimum wagon weight values may be expressed as a value rather than the formula shown in the example.

2. Description of Variant 1 provisionally approved on 1/10/15

Using Mettler Toledo model MTX load cells of 45 000 kg maximum capacity (accuracy class C3 or C4) instead of the model PDX load cells described for the pattern. The load cells are also described in the documentation of approval NSC No S381.

Note 1: This variant applies only to upgrades of instruments formerly approved and installed in accordance with Certificate of Approval NSC 6/10B/72.

3. Description of Variant 2 provisionally approved on 1/10/15

With an alternative arrangement, in which two platforms are provided, separated so as to enable weighing of both bogies of a wagon at the same time, thereby determining the wagon weight and the total train weight.

TEST PROCEDURE

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

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

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