



Australian Government
**Department of Industry, Science,
Energy and Resources**

**National
Measurement
Institute**

36 Bradfield Road, West Lindfield NSW 2070

**Certificate of Approval
NMI 6/20A/12**

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.

AMCS Model Vehicle Data Hub Wheeled Loader Weighing Instrument

submitted by AMCS Ltd
City East Plaza,
Floor 6, Block C
Ballysimon
Co. Limerick
Ireland

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 51, *Automatic Catchweighing Instruments*, dated August 2009.

This approval becomes subject to review on 1/07/25, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variant 1 approved – certificate issued	01/06/20

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 6/20A/12' 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.

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

Special Conditions of Approval

For this type of instrument, the ability to perform within the specified maximum permissible errors may be influenced by characteristics of the vehicle or lifting system to which it is fitted.

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

In the event of unsatisfactory performance this approval may be withdrawn.

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



Darryl Hines
Manager
Policy and Regulatory
Services

TECHNICAL SCHEDULE No 6/20A/12

1. Description of Pattern **approved on 01/06/20**

The AMCS model Vehicle Data Hub (VDH) class Y(b) automatic catchweighing instrument (Figure 1) of 300 kg maximum capacity with a verification scale interval of 1 kg fitted to a waste bin pick-up vehicle. The minimum capacity is 5 kg.

Note: If used for other than the weighing of waste, the minimum capacity is 10 kg.

The system is intended for the determination of the net weight of the contents of a waste bin picked up by (emptied into) a waste bin pick up vehicle, to which the instrument has been fitted. A transaction will generally be the result of a weighing of the full waste bin, with the result of the weighing of the empty waste bin subtracted from this. The system may also be suitable for other similar applications.

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

1.1. Weighing Mechanism

The AMCS model VDH comprises a weighing module incorporating a Flintec model PC2H C3 single-point type load cell (Figure 2a) of 2000 kg maximum capacity, mounted as part of the waste bin lifting mechanism at the rear of the vehicle (Figure 3a).

The system also includes an inclinometer Type LISD53E mounted on the weighing board to compensate weight values for out-of-level conditions, and a 270° rotary analogue potentiometer (Figure 2c) to sense the location of the lifting mechanism and hence determine an appropriate 'weighing window' for the weight determination.

1.2 Weighing Indication

The weighing indication comprises AMCS model VDH analogue data processing unit (Figure 4a) and an LCD display (Figure 4b) which provides the system information and weight values of full waste bin, empty waste bin and net payload.

The load cell and other sensors are connected to an AMCS model VDH analogue data processing unit, which utilises data from the sensors to determine the weight value.

1.3 Power Supply

The system is powered from the power supply of the vehicle (17 - 32 V DC).

1.4 Additional Information Regarding System

The following is additional information regarding operation of the system.

- The system utilises information from the LISD53E inclinometer, to compensate weight values for out-of-level conditions in longitudinal and transverse directions, and prevents the weight determination if levels of tilt up to ± 6 degrees are exceeded.
- The system is intended to only weigh whilst the vehicle is not moving, and a sensor/interlock to ensure this is provided. The sensor/interlock may be a part of the waste bin lifting mechanism.

Note: If the vehicle driver is not in the driver's seat when the instrument is in operation, the sensor/interlock is not required.

- Additional (optional) sensors may be provided (e.g. GPS location input or RFID tag reader).
- Instruments may be fitted with output sockets (output interfacing capability) for the connection of auxiliary and/or peripheral devices.

1.5 Data Storage/Printout

The system may incorporate a data storage device. For each weighing request weighing results together with identification including date and time are stored into the storage device. Alternatively (or in addition) a printer may be provided for printout of a receipt/transaction record.

Any printout shall comply with the requirements of NMI General Supplementary Certificate S1/0B.

1.6 Interfaces

Instruments may be fitted with interfaces for the connection of auxiliary and/or peripheral devices. Any interfaces shall comply with clause 4.2.4 of document NMI R51 (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 S1/0B (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 instrument or on an auxiliary or peripheral device, are not for trade use.

Instruments may be fitted with RS-232/485 serial data interfaces, CAN, RFID, and digital and analogue inputs/outputs.

1.7 Display Check

A display check is initiated whenever power is applied.

1.8 Sealing Provision

Provision is made for the calibration adjustments to be sealed.

- The potentiometer shall be sealed (using AMCS Heat Shrink Tubing (Figure 5a) or similar type seals) to seal against adjustment.
- The load cells shall be sealed (using AMCS Heat Shrink Tubing or similar type seals) to seal against replacement.
- The VDH process unit shall be sealed by applying destructible labels on opposite sides of a join in the housing (Figure 5b).
- The instrument is sealed by recording the event counter on verification.

Access to allow changing of set-up parameters including calibration parameters must be protected by a passcode.

The indicator automatically increments an event counter number each time the instrument is re-configured or calibrated.

The value of the event counter may be recorded on a destructible adhesive label attached to the instrument (as Config Count followed by a number).

Any subsequent alteration to the calibration will be evident as the recorded value and the current counter value will differ.

The event counter number can be seen in the switch-on display sequence when the power is first applied to the instrument.

1.9 Verification Provision

Provision is made for the application of a verification mark.

1.10 Descriptive Markings and Notices

Instruments carry the following markings:

Manufacturer's mark, or name written in full	AMCS
Indication of accuracy class	Y(b)
Pattern approval number for the instrument	NMI 6/20A/12
Maximum capacity	Max kg *
Minimum capacity	Min kg *
Verification scale interval	e = kg *
Serial number of the instrument

* These markings shall also be shown near the display of the result if they are not already located there.

1.11 Software

The software is designated version VDH:V3.xx.yy, where 'xx.yy' represents the identification of non-legally relevant software.

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

2. Description of Variant 1

approved on 01/06/20

Up to two load receptors (each with its own load cell) may be connected to a single VDH processing unit fitted with two weighing boards in a master-slave arrangement. Each weighing board is connected to its own potentiometer and display unit.

In this arrangement the system may operate in either of the following modes:

(a) Weighing smaller bins individually.

In this case each instrument operates in a single interval arrangement with a verification scale interval of 1 kg up to the maximum capacity of the instrument (300 kg).

(b) Weighing a single larger bin utilising both weighing modules.

In this case the bin is supported by both load receptors and operates in a single interval arrangement with a verification scale interval of 2 kg up to the maximum capacity of the instrument (600 kg). The minimum capacity is 10 kg.

Note: If used for other than the weighing of waste, the minimum capacity is 20 kg.

Where operation in mode (b) above is possible, additional sensor or device (e.g. a pin is used to link both receptors as shown in Figure 3c) may be provided when a single larger bin is in use, and hence to automatically switch the system into 'TRADE BIN' mode.

In 'TRADE BIN' mode one of two display units is used for display of the combined weight value.

Suitable markings regarding the combined value are required.

TEST PROCEDURE No 6/20A/12

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

Maximum Permissible Errors

The maximum permissible errors are specified in Schedule 1 of the *National Trade Measurement Regulations 2009*.

Note:

Instruments provide two individual weighings and net payload in a loading cycle.

The maximum permissible errors only apply to each individual weighing displayed and/or printed and/or recorded.

Application of National Instrument Test Procedure 6.8 for Waste Bin Pick-Ups

Loading cycle

The loading cycle is applicable to the tests described in NITP 6.8 with the exception of zero setting and transaction record test and is comprised of two parts, a weighing on the way up and a weighing on the way down without emptying the load. The vehicle must remain stationary during the lifting and loading cycle.

The test load shall including a bin (of known weight) and standard weights or test objects (of known weight).

1. Set the instrument to zero.
2. Place the test load on the load receptor.
3. Lift the test load and obtain an indication.
4. Record the indication on the test report.
5. Lower the test load, and obtain an indication and net payload.
6. Record the indication and net payload on the test report.
7. Repeat steps 2 to 6 four more times.

Note: For the tilting test only repeat steps 2 to 6 twice more.

Additional Weighing Performance Test

This test is mandatory and a standard loading cycle described in NITP 6.8 Clause 5.2 shall be followed. It can be completed in conjunction with the transaction record test described in NITP 6.8.

The test load shall include a bin (of known weight) and standard weights or test objects (of known weight). Note: The bin weight shall be equal to or greater than $\text{Min} + 3e$.

1. Set the instrument to zero.
2. Place a load of $1/2 \text{ Max}$ on the load receptor and complete a loading cycle at the normal lifting speed.

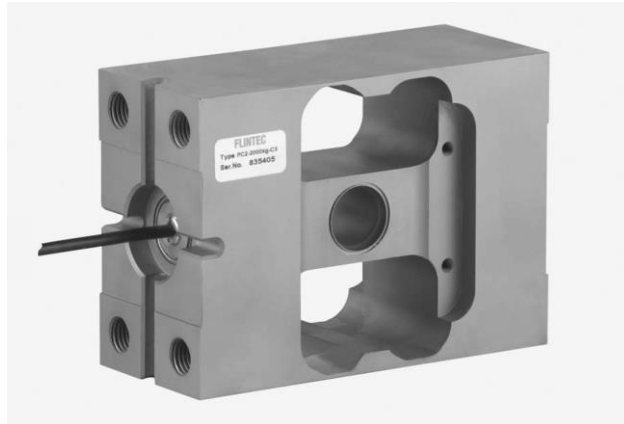
3. Record the indications up and down and determine if they are within MPE.
4. Ensure the net indication is equal to the difference between the up and down indications.
5. Repeat steps 2 to 4 four more times.
6. Place a load of between 1/2 Max and Max on the load receptor and complete a loading cycle at the normal lifting speed. If practical the load shall include the MPE change points (i.e. 50 e and 200 e).
7. Record the indications up, down and net payload and determine if they are within MPE.
8. Ensure the net indication is equal to the difference between the up and down indications.
9. Repeat steps 6 to 8 four more times.
10. Determine whether the instrument has **PASSED** or **FAILED**.

FIGURE 6/20A/12 – 1



Load Cell (Installed Behind The Load Receiver Frame)
AMCS Model VDH Wheeled Loader Weighing Instrument

FIGURE 6/20A/12 – 2



(a) Flintec Model PC2H Load Cell



(b) Rotary Potentiometer

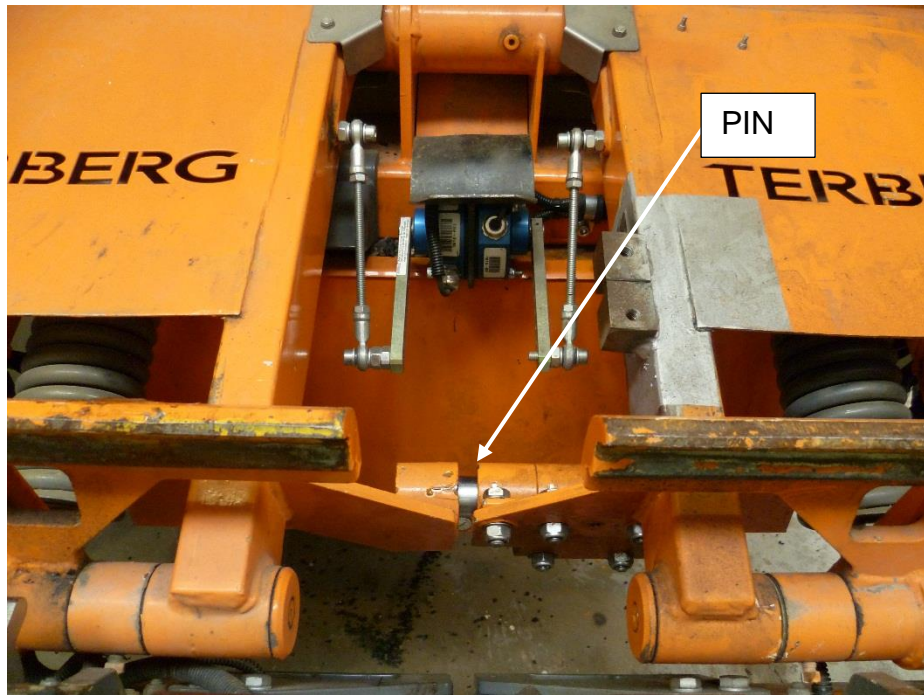
FIGURE 6/20A/12 – 3



(a) Load Cell (Installed Behind The Load Receiver Frame)



(b) Sensors Located to Define Measuring Window



(c) Pin for Weighing Single Large Bin

FIGURE 6/20A/12 – 4



(a) AMCS Model VDH Weighing Processing Unit



(b) AMCS Model VDH Display Unit

FIGURE 6/20A/12 – 5



(a) AMCS Heat Shrink Tubing Type Seal



(b) Seal of AMCS Model VDH Processing Unit

Sealing Arrangements

~ End of Document ~