Australian Government
Department of Industry, Innovation and Science

National Measurement Institute

Certificate of Approval

NMI 6/14B/29

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.

Intersystems Model BMW MASTERWEIGH INFINITY-780 Discontinuous Totalising Automatic Weighing Instrument

submitted by Intersystems, Inc
9575 North 109th Avenue
Omaha Nebraska 68142
USA

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 107, *Discontinuous Totalising Automatic Weighing Instruments (Totalising Hopper Weighers)*, dated July 2004.

This approval becomes subject to review on 1/05/21, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variants 1 & 2 approved – interim certificate issued	29/04/16
1	Pattern & variants 1 to 3 approved – certificate issued	24/11/16

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with approval number ‘NMI 6/14B/29’ 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 values of the performance criteria (maximum number of scale intervals etc.) applicable to the instrument shall be within the limits specified herein and in any approval documentation for the components where they are approved separately.

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

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 6/14B/29

1. Description of Pattern approved 29/04/16

An Intersystems model BMW MASTERWEIGH INFINITY-780 Class 0.2 discontinuous totalising automatic weighing (DTAW) instrument (Figure 1) having a weigh hopper of 18 000 kg maximum capacity.

The instrument is installed in a permanently fixed location.

Note: This approval has been granted with reference to document NMI R 107, *Discontinuous Totalising Automatic Weighing Instruments (Totalising Hopper Weighers)*, dated July 2004. The following description is intended to introduce terms used in this Certificate and Technical Schedule which may be additional to those in that document but which are consistent with the terminology in the document.

The system aims to provide a *bulk load delivery* using a particular automatic *delivery sequence* (the term 'delivery' may also be taken to refer to 'receipt').

This sequence involves the totalisation of the results of a number of *discrete load deliveries* or *weighing cycles*, each of which involves the division of the bulk product into *discrete loads*, according to a *target discrete load* the mass of which is then determined by weighing to give the *discrete load delivered* following which the product is discharged to the bulk output. Note that the *target discrete load* may be achieved by stopping or slowing the bulk product delivery prior to the *target discrete load* value being reached according to *discrete load target shutoff adjustments* (such as inflight adjustments or slow flow pre-sets).

Each *discrete load delivered* is totalised (at any time this may be termed the *cumulative totalisation*).

The *target discrete load* is generally a pre-selected value that is the same for most of the *discrete load deliveries* (this may be termed the *pre-selected target discrete load*). However for the final one or two deliveries in the *bulk load delivery* the *target discrete load* may differ (for example to avoid excessively large or small *discrete loads*). In addition, arrangements for stopping or slowing the bulk product delivery prior to the *target discrete load* value being reached may vary for the final discrete deliveries in the delivery sequence according to *target totalised load shutoff adjustments* (such as inflight adjustments or slow flow pre-sets).

The *totalised bulk load delivered* may be intended to be close to a requested amount (*target totalised load*) in which case adjustments and pre-sets as described above may be used to achieve this as closely as possible.

Alternatively the *totalised bulk load delivered* may be the quantity measured without a particular target totalised load.

The *totalised bulk load delivered* is the cumulative totalisation (sum of all discrete loads delivered), in the complete *bulk load delivery*. The transaction is based on the *totalised bulk load delivered* (not the *target totalised load*).

1.1 Details

The model BMW MASTERWEIGH INFINITY-780 instrument is a Class 0.2 discontinuous totalising automatic weighing instrument having a configuration and parameters as shown in Table 1, i.e. Maximum capacity, minimum capacity, totalisation scale interval, target discrete load, minimum totalised load (Σmin), and using the number of load cells of the load cell capacity indicated:

The model BMW MASTERWEIGH INFINITY-780 instrument permanently records the totalised bulk load delivered and the net value of each discrete load delivered. This information can be sent to a printer if required.

Note: The discrete load values are NOT approved for trade use. The totalised bulk load delivered (a total of the discrete load delivered values) is the value approved for trade use.

1.2 Weighing System

The model BMW MASTERWEIGH INFINITY-780 (Figure 1) comprises components as described below (Figure 2 provides a general system overview).

Note: 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.

(a) A weigh bin hopper with out-feed gate (Figure 1a), using three or four (as indicated in Table 1). Mettler Toledo model SLS510 load cells, each load cell being of the capacity indicated in Table 1. The load cells are located symmetrically around the weigh bin hopper.

(b) A Mettler Toledo 780 digital indicator (also described in approval NMI S502) and running a 'Taskexpert' program.

(c) An AB micrologix 1100 PLC to control gates, read limit status and indicators, with associated networking and input/output modules

(d) A Printer to print each discrete load delivered (draft) and totals for each, or equivalent record in electronic form. The system prevents operation in the event of printer or power failure (see Figure 5 for typical printout).

(e) Actuators and associated position sensors to control the product in-feed and out-feed gates for the weigh bin.

(f) An optional operator interface computer.

1.3 Indicator

The MasterWeigh Infinity software running on the IND780 controls the weighing sequence including checking various aspects of the system operation (blocked chutes, gates open or closed as appropriate) and filling of the weigh-bin by starting and stopping product flow (opening and closing of in-feed and out-feed gates).

Weight data from the digital indicator is continually provided to the MasterWeigh Infinity software which uses this information to determine the discrete load values, totalise them to determine the totalised bulk load delivered, and store this weight data.

Where sufficient product has been supplied, the MasterWeigh Infinity software finalises the delivery and totalises the discrete load deliveries to form the total bulk load delivered value.

The weight data, together with information regarding the weighing sequence status, is also provided continually to the operator interface. The operator interface can retrieve weight data for printing if required.

1.4 Operation

An overview of the sequence of operation of the system is shown in Figure 4.

The system is considered to be a discontinuous totalising automatic weighing instrument as it follows a predetermined program of automatic processes characteristic of the instrument. The product is weighed by individual discrete loads, which are totalised to determine the bulk product weighed.

(a) Initially the target discrete load ('batch target') is set in the MasterWeigh Infinity (generally this will be a fixed value and will not vary between deliveries). The target discrete load may be programmed to different values for different grain types due to the volume of the grain.

The system remains in an idle state until a delivery sequence has been set and a target totalised load value entered.

(b) The system will commence filling the weigh hopper via the feed gate until the target discrete load value is reached.

(c) Once the weigh bin is full (or no further product is available) and the feed gates are closed, the system waits for a stable weight signal (determined by receipt of a stable signal from the indicator), and records the gross weight reading for the loaded weigh bin.

(d) The system checks the status of alarms and inputs and then discharges the product into the lower garner. When the weigh bin is empty, the discharge gates are closed and when the weight reading is stable, the system records the empty ('tare') weight reading for the empty bin.

(e) The gross weight value for the loaded bin at (c), minus the tare weight value for the empty bin at (d) is the discrete load delivered from the weigh bin. This can then be added to values of previous cycles to provide a cumulative totalised load.

1.5 Markings and Notices

(a) Instruments carry the following markings, grouped together in a clearly visible place on the instrument, either on a descriptive plate fixed near the indicating device or on the indicating device itself:

Manufacturer's mark, or name written in full	Intersystems Ltd
Indication of accuracy class	0.2
Pattern approval number for the instrument	NMI 6/14B/29
Model number	BMW MASTERWEIGH INFINITY-780
Serial number of the instrument	.....
Maximum capacity	*Max* = 18 000 kg *
Minimum capacity	*Min* = 5000 kg *
Minimum totalised load	Σ_{min} = 15 000 kg *
Totalisation scale interval	d_t = 10 kg
Material to be measured	.....

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

(b) Instruments carry a notice visible to the operator stating 'TARGET DISCRETE LOAD SHALL BE ……. kg ONLY', or similar wording (as indicated in Table 1, i.e. 15 000 kg for the model BMW MASTERWEIGH INFINITY 780).

1.6 Verification Provision

Provision is made for the application of a verification mark.

1.7 Sealing Provision

The digital indicator shall be sealed as described in the documentation of approval NMI S502.

2. Variant 1 **approved on 29/04/16**

The BMW MASTERWEIGH INFINITY instrument in various versions as Class 0.2 discontinuous totalising automatic weighing instruments as shown in Table 1.

Note that the pattern (INFINITY 780) is shown in **bold**.

TABLE 1

	BMW MASTERWEIGH INFINITY-			
	005	13	25	40
Max Capacity (kg)	120	300	600	1000
Min Capacity (500 x dt) (kg)	25	50	100	250
Totalisation scale interval (kg)	0.05	0.1	0.2	0.5
Target Discrete load (kg)	100	250	500	800
Minimum Totalised Load (kg)	250	500	1000	3500
Load cell capacity (kg)	100	250	500	1000
No. of load cells	3	3	3	3

	BMW MASTERWEIGH INFINITY-			
	75	105	167	336
Max Capacity (kg)	1500	2500	3000	7000
Min Capacity (500 x dt) (kg)	500	500	500	2500
Totalisation scale interval (kg)	1	1	1	5
Target Discrete load (kg)	1250	2000	2500	6000
Minimum Totalised Load (kg)	7000	6000	4000	50000
Load cell capacity (kg)	1000	2500	2500	5000
No. of load cells	3	3	3	3

	BMW MASTERWEIGH INFINITY-				
	420	550	625	**780**	890
Max Capacity (kg)	10000	12000	15000	**18000**	25000
Min Capacity (500 x dt) (kg)	2500	2500	2500	**5000**	5000
Totalisation scale interval (kg)	5	5	5	**10**	10
Target Discrete load (kg)	8500	10000	12500	**15000**	20000
Minimum Totalised Load (kg)	35000	30000	25000	**75000**	60000
Load cell capacity (kg)	5000	7500	7500	**7500**	10000
No. of load cells	3	3	4	**4**	4

Note: The Target Discrete load is as indicated above. The system will recalculate a cut-off value for each discrete load (draft) depending on total load remaining.

3. Variant 2 approved on 29/04/16

The BMW MASTERWEIGH INFINITY instrument in various versions as shown in Table 1 (Variant 1), but as Class 0.5, Class 1 or Class 2 discontinuous totalising automatic weighing instruments.

4. Variant 3 approved on 24/11/16

The BMW MASTERWEIGH INFINITY-105 instrument as a Class 0.2 discontinuous totalising automatic weighing instruments, having alternative characteristics as shown below.

BMW MASTERWEIGH INFINITY-105	
Max Capacity (kg)	2500
Min Capacity (500 x dt) (kg)	500
Totalisation scale interval (kg)	1
Target Discrete load (kg)	1000
Minimum Totalised Load (kg)	8500
Load cell capacity (kg)	2500
No. of load cells	3

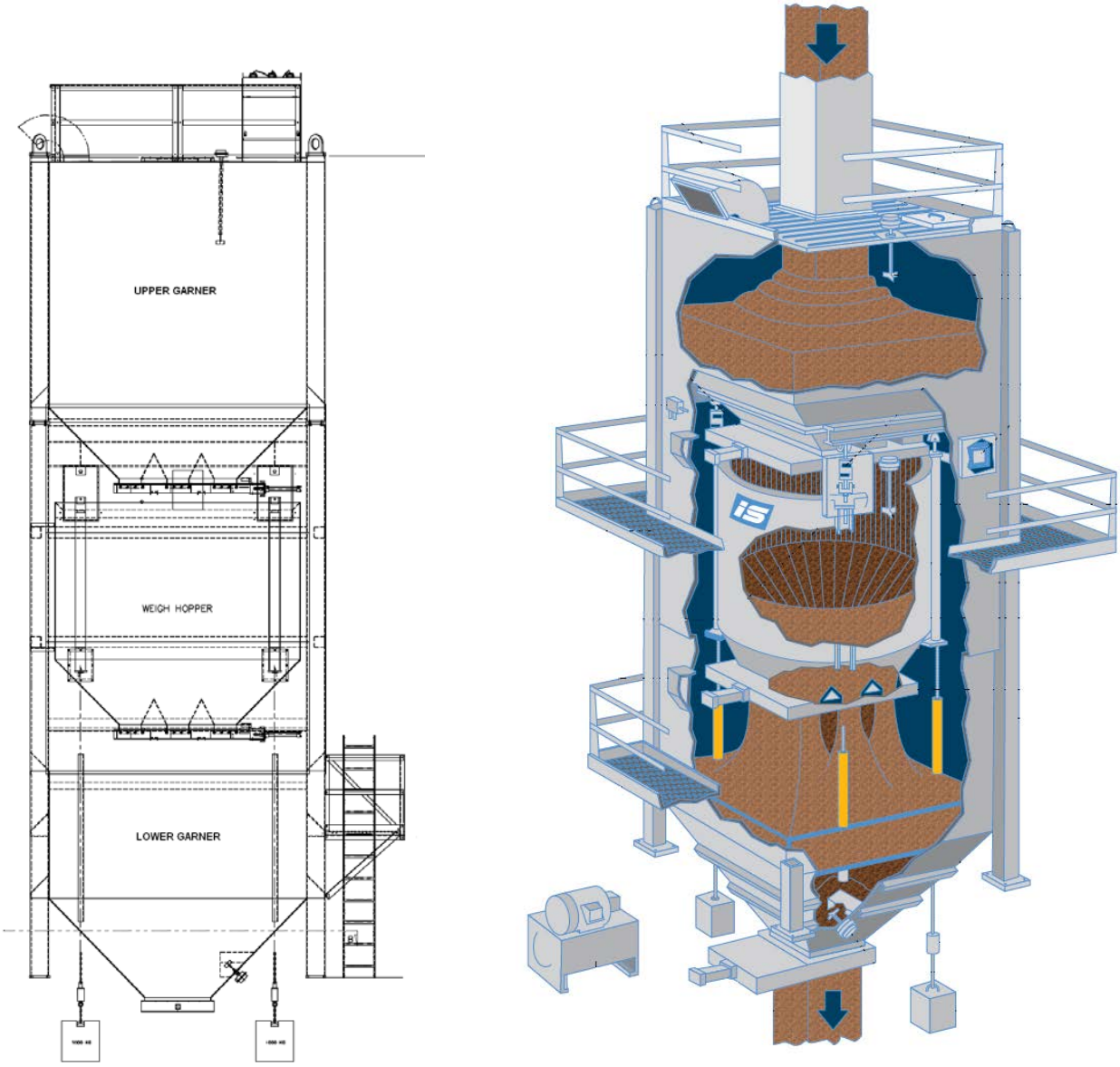
TEST PROCEDURE No 6/14B/29

Instruments shall be tested in accordance with any relevant tests for this category of instrument.

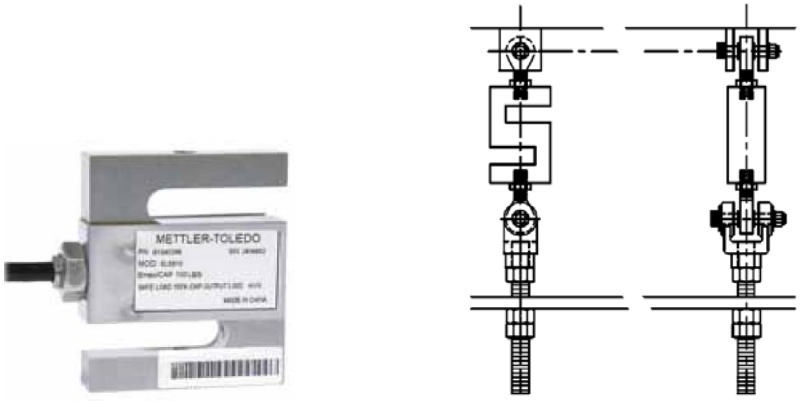
Maximum Permissible Errors

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

FIGURE 6/14B/29 – 1



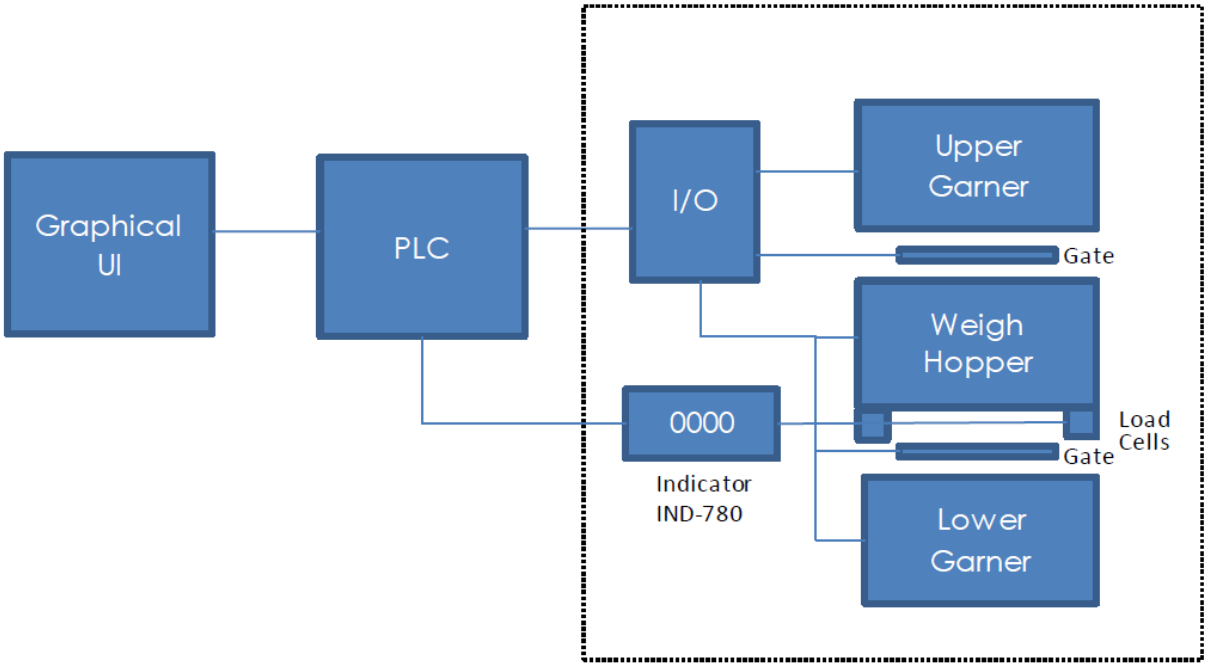
(a) Intersystems BWM



(b) Load Cell & Load Cell Mounting

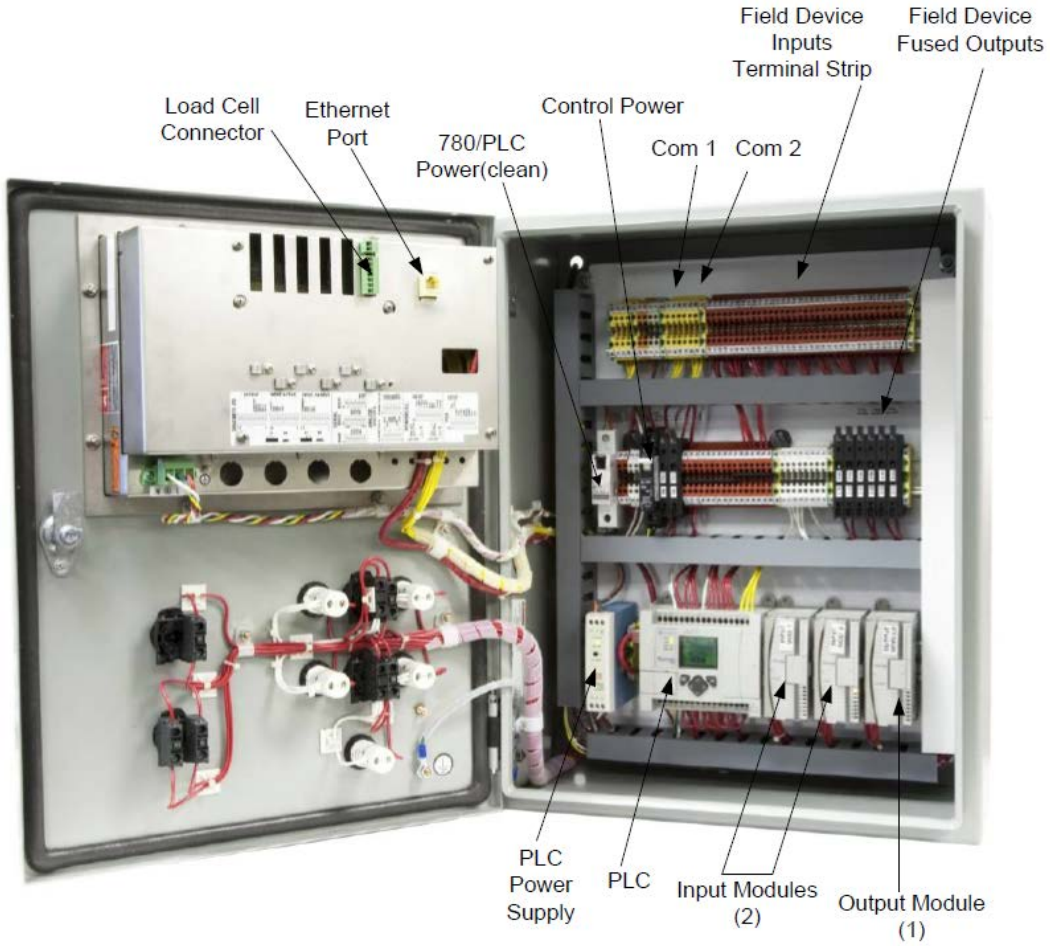
Intersystems Model BMW MASTERWEIGH INFINITY Discontinuous Totalising Automatic Weighing Instrument

FIGURE 6/14B/29 – 2



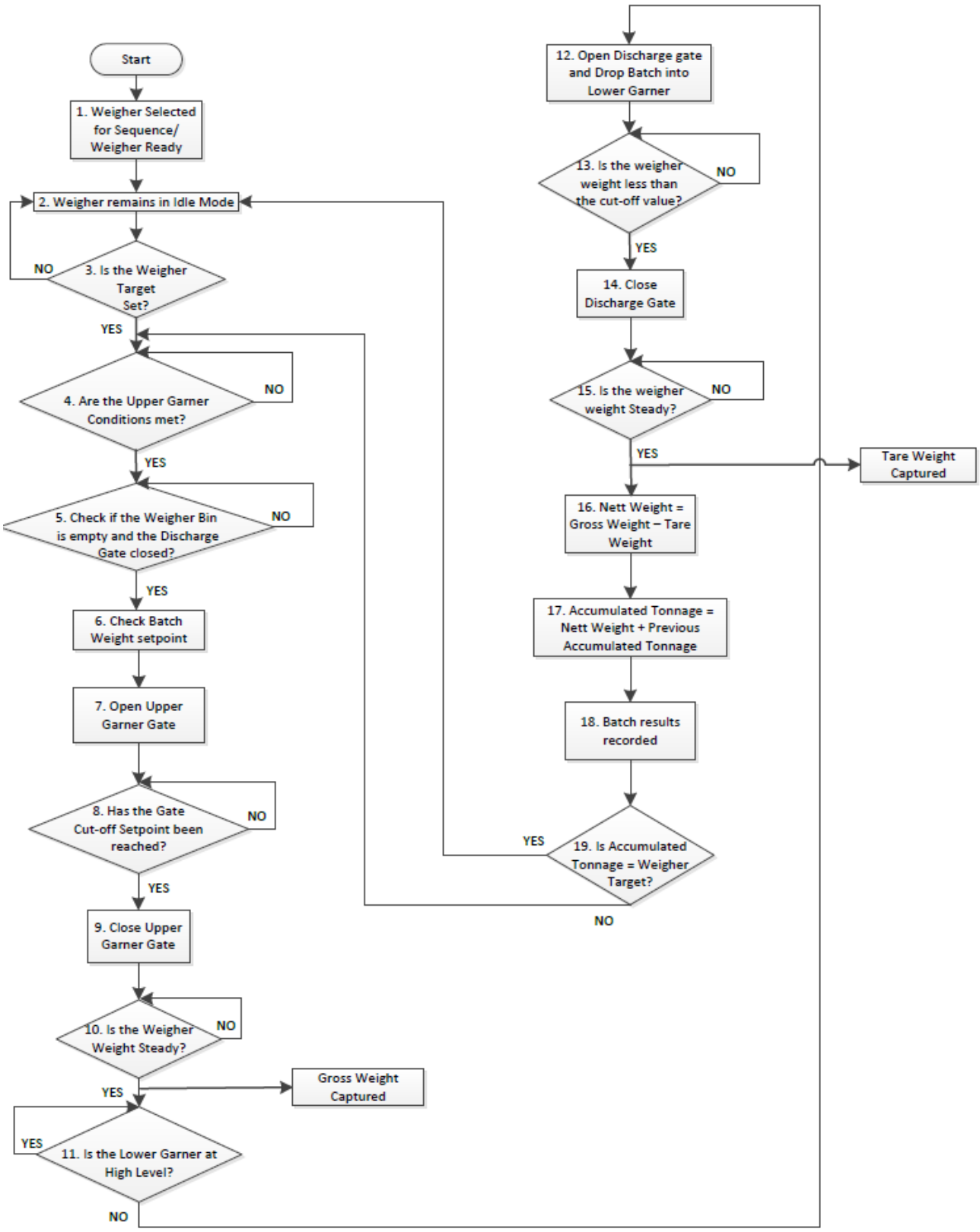
Intersystems Model BMW MASTERWEIGH INFINITY Weighing Instrument – System Overview

FIGURE 6/14B/29 – 3



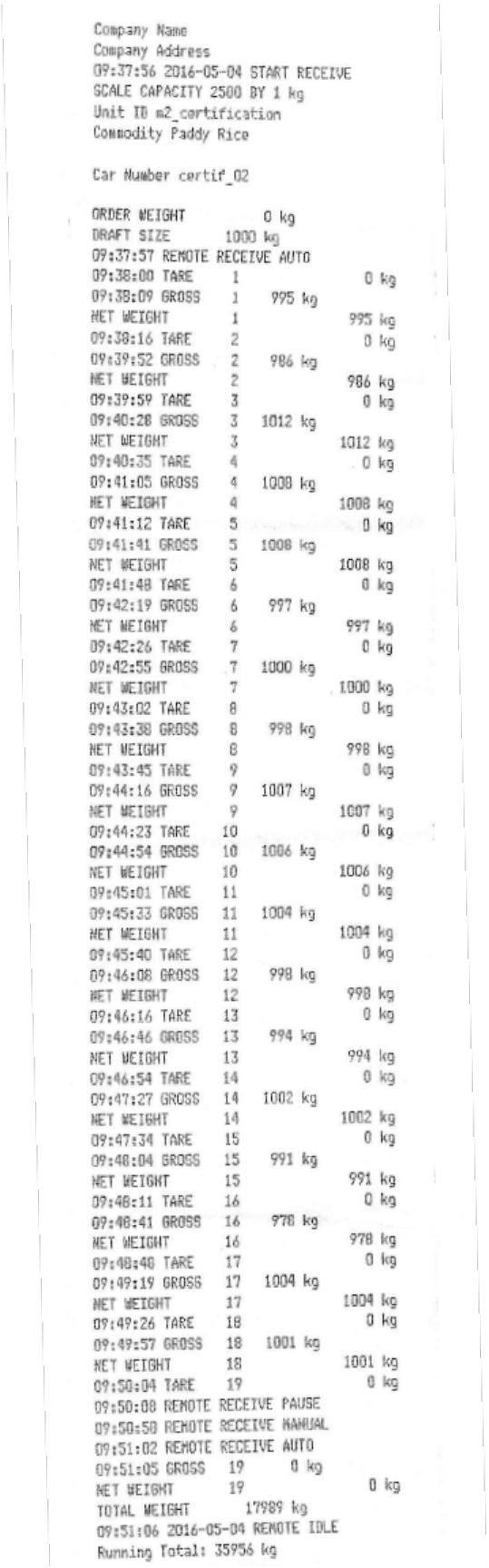
MasterWeigh Controller with IND780 indicator

FIGURE 6/14B/29 – 4



Weighing Sequence Flowchart (Overview)

FIGURE 6/14B/29 – 5



```
Company Name
Company Address
09:37:56 2016-05-04 START RECEIVE
SCALE CAPACITY 2500 BY 1 kg
Unit ID m2_certification
Commodity Paddy Rice

Car Number certif_02

ORDER WEIGHT          0 kg
DRAFT SIZE         1000 kg
09:37:57 REMOTE RECEIVE AUTO
09:38:00 TARE     1                0 kg
09:38:09 GROSS    1    995 kg
NET WEIGHT        1              995 kg
09:38:16 TARE     2                0 kg
09:39:52 GROSS    2    986 kg
NET WEIGHT        2              986 kg
09:39:59 TARE     3                0 kg
09:40:28 GROSS    3   1012 kg
NET WEIGHT        3             1012 kg
09:40:35 TARE     4                0 kg
09:41:05 GROSS    4   1008 kg
NET WEIGHT        4             1008 kg
09:41:12 TARE     5                0 kg
09:41:41 GROSS    5   1008 kg
NET WEIGHT        5             1008 kg
09:41:48 TARE     6                0 kg
09:42:19 GROSS    6    997 kg
NET WEIGHT        6              997 kg
09:42:26 TARE     7                0 kg
09:42:55 GROSS    7   1000 kg
NET WEIGHT        7             1000 kg
09:43:02 TARE     8                0 kg
09:43:38 GROSS    8    998 kg
NET WEIGHT        8              998 kg
09:43:45 TARE     9                0 kg
09:44:16 GROSS    9   1007 kg
NET WEIGHT        9             1007 kg
09:44:23 TARE    10                0 kg
09:44:54 GROSS   10   1006 kg
NET WEIGHT       10             1006 kg
09:45:01 TARE    11                0 kg
09:45:33 GROSS   11   1004 kg
NET WEIGHT       11             1004 kg
09:45:40 TARE    12                0 kg
09:46:08 GROSS   12    998 kg
NET WEIGHT       12              998 kg
09:46:16 TARE    13                0 kg
09:46:46 GROSS   13    994 kg
NET WEIGHT       13              994 kg
09:46:54 TARE    14                0 kg
09:47:27 GROSS   14   1002 kg
NET WEIGHT       14             1002 kg
09:47:34 TARE    15                0 kg
09:48:04 GROSS   15    991 kg
NET WEIGHT       15              991 kg
09:48:11 TARE    16                0 kg
09:48:41 GROSS   16    978 kg
NET WEIGHT       16              978 kg
09:48:48 TARE    17                0 kg
09:49:19 GROSS   17   1004 kg
NET WEIGHT       17             1004 kg
09:49:26 TARE    18                0 kg
09:49:57 GROSS   18   1001 kg
NET WEIGHT       18             1001 kg
09:50:04 TARE    19                0 kg
09:50:08 REMOTE RECEIVE PAUSE
09:50:58 REMOTE RECEIVE MANUAL
09:51:02 REMOTE RECEIVE AUTO
09:51:05 GROSS   19      0 kg
NET WEIGHT       19                0 kg
TOTAL WEIGHT      17989 kg
09:51:06 2016-05-04 REMOTE IDLE
Running Total: 35956 kg
```

Typical Output / Printout

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