



Australian Government
**National Measurement
Institute**

Bradfield Road, West Lindfield NSW 2070

Notification of Change
Certificate of Approval No 6/10B/70
Change No 1

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

The following changes are made to the approval documentation for the

Schenck Model TL01 Weighing Instrument

submitted by Schenck Process GmbH
 c/o Schenck Australia Pty Ltd
 Unit 1/47 Epping Road
 North Ryde NSW 2113.

- A. In Certificate of Approval No 6/10B/70 and its Technical Schedule both dated 20 February 2004, all references to the name of the submitter should be amended as follows:
- “Schenck Australia Pty Ltd” should now read:
 “Schenck **Process** Australia Pty Ltd”
- B. In Certificate of Approval No 6/10B/70 dated 20 February 2004;
1. The Condition of Approval referring to the review of the approval should be amended to read:
- “This approval becomes subject to review on 1 September 2013, and then every 5 years thereafter.”
2. The DESCRIPTIVE ADVICE should be amended by adding the following:
 “May also be known as Schenck Process instruments of the same model.”
3. The FILING ADVICE should be amended by adding the following:
 “Notification of Change No 1 dated 16 November 2009”

- C. In Technical Schedule No 6/10B/70 dated 20 February 2004:
1. Clause **1. Description of Pattern** should be amended by adding the following:
“May also be known as Schenck Process instruments of the same model.”
 2. The 1st paragraph of clause **1.2 Load cells** should be amended by adding the following:
“May also be known as Schenck Process load cells of the same model.”
 3. Clause **1.3 Indicator** should be amended by adding the following:
“Alternatively, a Schenck Process model DISOMAT Tersus indicator (as described in the documentation of approval NMI S516) may be used.”
 4. Clause **1.5 Markings** should be amended by changing the reference to the manufacturer to read:
“Schenck **Process** Australia Pty Ltd”
 5. In clauses **2.1.1 The System** (referring to Variant 1), **2.1.3 Programmable Logic Controller**, **2.1.4 Weighing and Loading Operation**, **2.2 Variant 2** and **2.3 Variant 3**, all references to ‘Schenck’ should be amended by adding “(or Schenck Process)”.
 6. In FIGURES 1 and 2, the references to ‘Schenck’ in captions at the bottom should be amended by adding “(or Schenck Process)”.
 7. In FIGURE 3, the text “Schenck RTN 47t C3” and “Schenck DISOMAT B” should be deleted.

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 stylized cursive letters, positioned to the right of the signature text.



Australian Government

National Standards Commission

12 Lyonpark Road, North Ryde NSW 2113 Australia

Certificate of Approval

No 6/10B/70

Issued 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
Schenck Model TL01 Weighing Instrument

submitted by **Schenck Process GmbH**
c/o Schenck Australia Pty Ltd
Unit 1/47 Epping Road
North Ryde NSW 2113.



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.

CONDITIONS OF APPROVAL

This approval becomes subject to review on 1 September 2008, and then every 5 years thereafter.

Instruments purporting to comply with this approval shall be marked NSC No 6/10B/70 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 Commission 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 the Commission's Document NSC P 106.

The Commission 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.

The pattern as approved herein or with substitute Commission-approved load cells and/or indicators and in other capacities, or with different platform sizes, shall comply with General Certificate No 6B/0.

Note: New instruments manufactured under this approval shall only use load cells and/or indicators with current NSC supplementary certificates.

DESCRIPTIVE ADVICE

Pattern: approved 28 August 2003

- A Schenck model TL01 self-indicating hopper weighing instrument of 100 000 kg maximum capacity.

Variants: approved 28 August 2003

1. In a system for the sequential filling of rail wagons.
2. Hopper weighing instruments in certain capacities.

Variant: approved 18 February 2004

3. Platform weighing instruments in certain capacities.

Technical Schedule No 6/10B/70 describes the pattern and variants 1 to 3.

FILING ADVICE

The documentation for this approval comprises:

Certificate of Approval No 6/10B/70 dated 20 February 2004
Technical Schedule No 6/10B/70 dated 20 February 2004 (incl. Test Procedure)
Figures 1 to 3 dated 20 February 2004

Signed by a person authorised under Regulation 60 of the National Measurement Regulations 1999 to exercise the powers and functions of the Commission under this Regulation.



TECHNICAL SCHEDULE No 6/10B/70

Pattern: Schenck Model TL01 Weighing Instrument

Submittor: Schenck Process GmbH
c/o Schenck Australia Pty Ltd
Unit 1/47 Epping Road
North Ryde NSW 2113

1. Description of Pattern

A Schenck model TL01 self-indicating hopper weighing instrument (Figure 1) of 100 000 kg maximum capacity and approved for use with a verification scale interval of 50 kg.

1.1 Basework

The model TL01 basework has the weigh bin fully supported by four load cells that are mounted on a support frame/structure.

1.2 Load Cells

Four Schenck model RTN 47t C3 load cells of 47 000 kg capacity are used, mounted as shown in Figure 2.

The load cells are also described in the approval documentation of NSC approval No S347.

1.3 Indicator

A Schenck model DISOMAT B *plus* digital indicator is used. The indicator is described in the documentation of NSC approval No S402.

1.4 Sealing Provision

Provision is made for the calibration adjustments in the indicator to be sealed as described in the approval documentation for the indicator used.

1.5 Markings

Instruments carry the following markings:

Manufacturer's mark, or name written in full	Schenck Australia Pty Ltd
Indication of accuracy class	Ⓜ
Pattern approval mark for the instrument	NSC No 6/10B/70
Pattern approval mark for the indicator	NSC No S...
Pattern approval mark for the load cells	NSC No S...
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.

1.6 Verification/Certification Provision

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

In addition suitable provision must be made for the application of suitable verified masses to the instrument as required for verification and certification purposes. It may be necessary for such masses to be incorporated within the design of the instrument.

2. Description of Variants

2.1 Variant 1

The pattern or variant 2 with additional controls and used in a system for the sequential filling of rail wagons.

2.1.1 The System

In addition to the equipment described with the pattern, the train wagon loading system comprises the following:

- An Allen Bradley model ControlLogic 1756-L55 programmable logic controller (PLC) or any other compatible PLC connected to the indicator of the pattern.
- A computer operator interface consisting of custom software designed and programmed by Schenck Australia. The software consists of a database for monitoring transport information, loading details and final generation of the material manifest for the consignment just loaded into the train wagons.
- Photoelectric sensors which are used to both identify the location of the wagons for positioning the hopper chutes and also as safety interlocks to prevent any loading operations taking place when the position of the wagon to be loaded is not correct.
- A system of hydraulic cylinders and associated equipment used to operate the surge bin gates, weigh bin gates and the telescopic chutes. In addition the system is able to raise and lower the verified masses (typically 20% of maximum capacity) incorporated into the design of the instrument for calibration/verification purposes.
- An interface with the loading operator's computer system that enables recorded loading details to be transferred for preparation of a manifest for billing purposes, including a total of the quantity delivered.

Figure 3 shows a block diagram of the system and its interfaces.

2.1.2 Operator Interface System

The operator interface system (programmed using Citec software for interfacing to "supervisory control and data acquisition" (SCADA) systems) is used to control the wagon loading sequence and generate the train manifest.

Prior to loading a train the operator enters the details of the train into the system. This information is obtained from the operator's work schedule, which is part of the customer's data logging system. Once the information is loaded the software creates a database for the train.

The operator enters the material specification and weight per wagon for the train into the programmable logic controller (PLC). This determines the sequence and timing of operations for the loading of each wagon.

When the operation of filling a wagon is complete the actual weight of material loaded is registered in the PLC, which then transfers this information into the operator interface system for inclusion into the manifest.

The operator interface system is also used for annunciation of alarms initiated by the PLC.

At the completion of the train loading operation the completed manifest is printed and also transferred to the operator's management system.

Data on the screen is not used for costing purposes. The operator interface system cannot be used to alter programming within the PLC.

2.1.3 Programmable Logic Controller (PLC)

The PLC is used for the following:

- To interface with the Schenck digital indicator to transfer weight information.
- To interface with the computer used in the operator interface system.
- To control the sequenced operation of the surge bin gates to supply the required amount of material per wagon as determined by the operator interface system.
- To control the automatic operation of chutes and load bin gates as sequenced by the photoelectric sensors.
- To initiate any alarm conditions.

2.1.4 Weighing and Loading Operation

The predetermined parameters for the train to be loaded are entered into the operator's interface system.

The operator initiates the start of loading from the operator interface system. This opens the four surge bin gates and allows material to flow into the weigh hopper. The surge bin gates close, at a predetermined rate, to attempt to achieve the required weight in the weigh hopper.

After this, and once all surge bin gates are closed, the system records the material weight in the weigh bin. The recording of the weight value depends upon receipt of a 'no motion' signal from the Schenck digital indicator. The function of this is determined by the stability detection parameters of the indicator (see additional test in test procedure).

When the required material is available in the weigh hopper the train can begin to move through the loading system at a constant speed.

Once the photoelectric sensors sense the first wagon is in the correct position the system commences loading the wagon by discharging the weigh hopper.

At completion of loading the weigh hopper gate is closed.

The system then records the weight of any material left in the bin.

The actual amount loaded into the wagon (weigh bin start minus weigh bin finish) is then recorded in the manifest.

This procedure is repeated until all the wagons in the train have been loaded.

Once the complete train is loaded the final manifest file is printed and transferred to the operator's management system.

2.2 Variant 2

Other **Schenck** hopper weighing instruments of the TL01 series in capacities of:

- 100 kg up to 1499 kg;
- 1500 kg up to 14 999 kg;
- 15 000 kg up to 149 999 kg; and
- 150 000 kg and above,

using Commission-approved load cells and a Commission-approved digital indicator (in accordance with NSC General Certificate of Approval No 6B/0).

Instruments are approved for use with up to 4000 verification scale intervals (subject to the approval parameters of the load cells and indicator).

Instruments used with more than 3000 verification scale intervals shall be provided with wind protection in accordance with clause **4. Wind Effects** of NSC General Certificate No 6B/0.

Instruments are either:

- (a) fitted with 3, 4 or 5 Commission-approved load cells (arranged symmetrically to ensure even loading of each cell) where the hopper is a vertical cylindrical or tank-type load receptor directly supported by the load cells; or
- (b) fitted with 4 Commission-approved load cells where the hopper is a non-vertical cylindrical, or other hopper-type load receptor.

Note: Instruments with more than 4 load cells may be acceptable if prior written agreement from the Commission is obtained.

Suitable provision must be made for the application of suitable verified masses to the instrument as required for verification and certification purposes. It may be necessary for such masses to be incorporated within the design of the instrument.

Note: The load receptor may be in the form of a hopper or bag suspended from a base frame.

2.3 Variant 3



Schenck platform weighing instruments of the DVU series with the platform fully supported by no less than 4 and with up to 10 Commission-approved load cells. Instruments may be in capacities of:

- 100 kg up to 1499 kg;
- 1500 kg up to 14 999 kg;
- 15 000 kg up to 149 999 kg; and
- 150 000 kg and above,

using Commission-approved load cells and a Commission-approved digital indicator (in accordance with NSC General Certificate of Approval No 6B/0).

Instruments are approved for use with up to 4000 verification scale intervals (subject to the approval parameters of the load cells and indicator).

Instruments used with more than 3000 verification scale intervals shall be provided with wind protection in accordance with clause 4. **Wind Effects** of NSC General Certificate No 6B/0.

TEST PROCEDURE

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

Maximum Permissible Errors at Verification/Certification

The maximum permissible errors for increasing and decreasing loads on initial verification/certification for loads, m , expressed in verification scale intervals, e , are:

- $\pm 0.5 e$ for loads $0 \leq m \leq 500$;
- $\pm 1.0 e$ for loads $500 < m \leq 2\,000$; and
- $\pm 1.5 e$ for loads $2\,000 < m \leq 10\,000$.

Additional Test (Variant 1)

Although the instrument loads wagons sequentially in an automatic manner, the test procedure used is the same as that for a non-automatic weighing instrument, with the following addition:

Stability of Equilibrium

Adequate provision must be made to ensure that at the point of weight information recording, the system is in a state of stability. To achieve this the Schenck digital indicator used has the facility to provide a 'no motion' signal, which determines when a weight reading is taken.

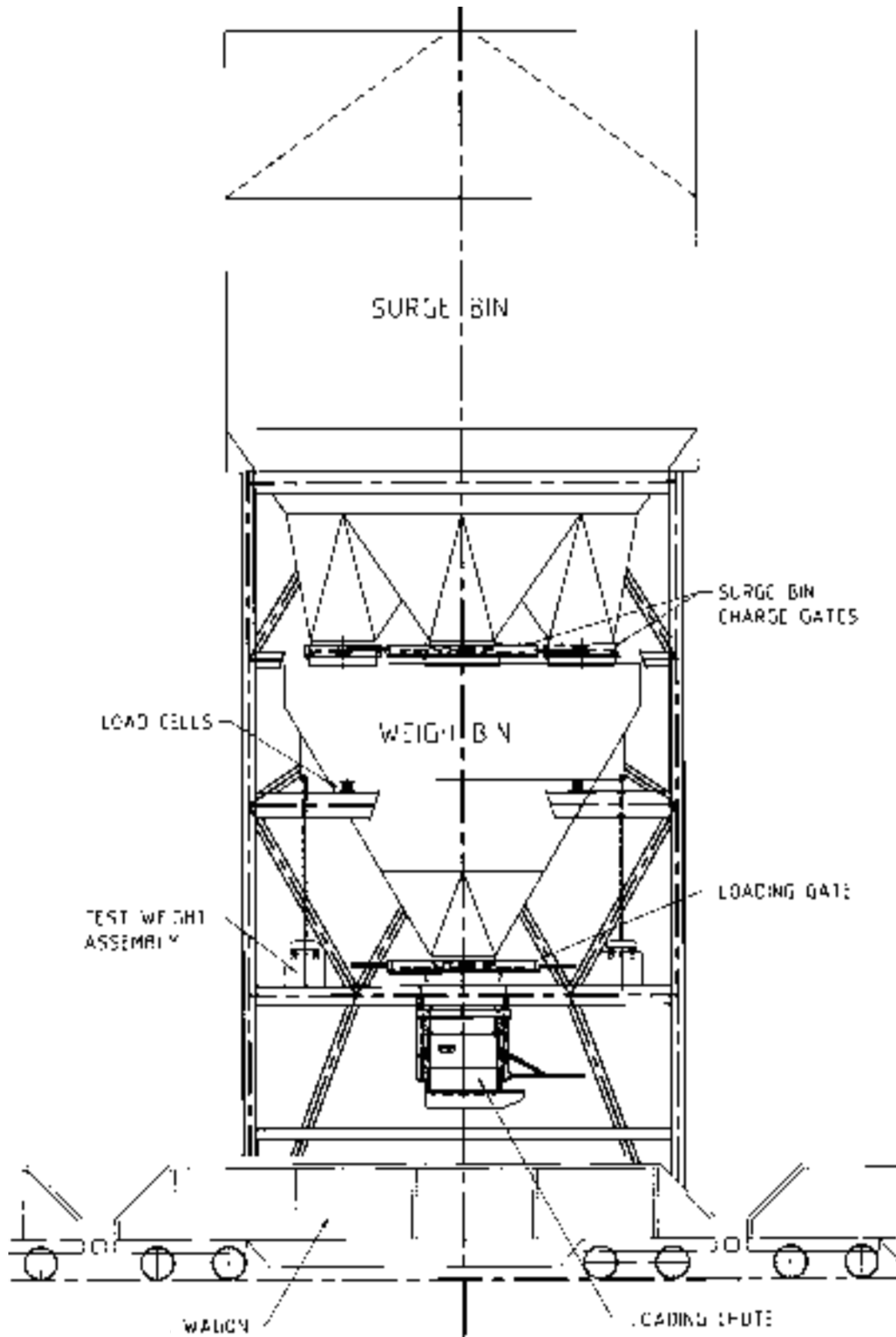
The required parameters for the 'no motion' signal to correctly indicate stable equilibrium may vary between installations depending on factors such as hopper capacity, scale interval and material being weighed.

It is important that when the parameters are set the resulting stabilising time is sufficient to achieve a state of no motion.

The following procedure is based on the requirements of clause 4.4.5 of *NSC Document 100, Pattern Approval Specifications for Non-automatic Weighing Instruments for Trade Use*, and may be used to determine that stable equilibrium has been achieved prior to the capturing of weight readings.

1. Allow the weigh bin to fill with material.
2. Record the reading that is captured when the no-motion signal appears on the indicator.
3. Observe the indication of the instrument for a period of 5 seconds (if necessary stop the automatic sequence to prevent additional loading or unloading).
4. Stable equilibrium is considered to be achieved (at the time when the reading is captured) when, over the 5 second period, no more than two adjacent values are indicated, one of which is the value captured at point 2 above.
5. Allow the weigh bin to be emptied of material.
6. Repeat steps 2 to 5 with the empty weigh bin.

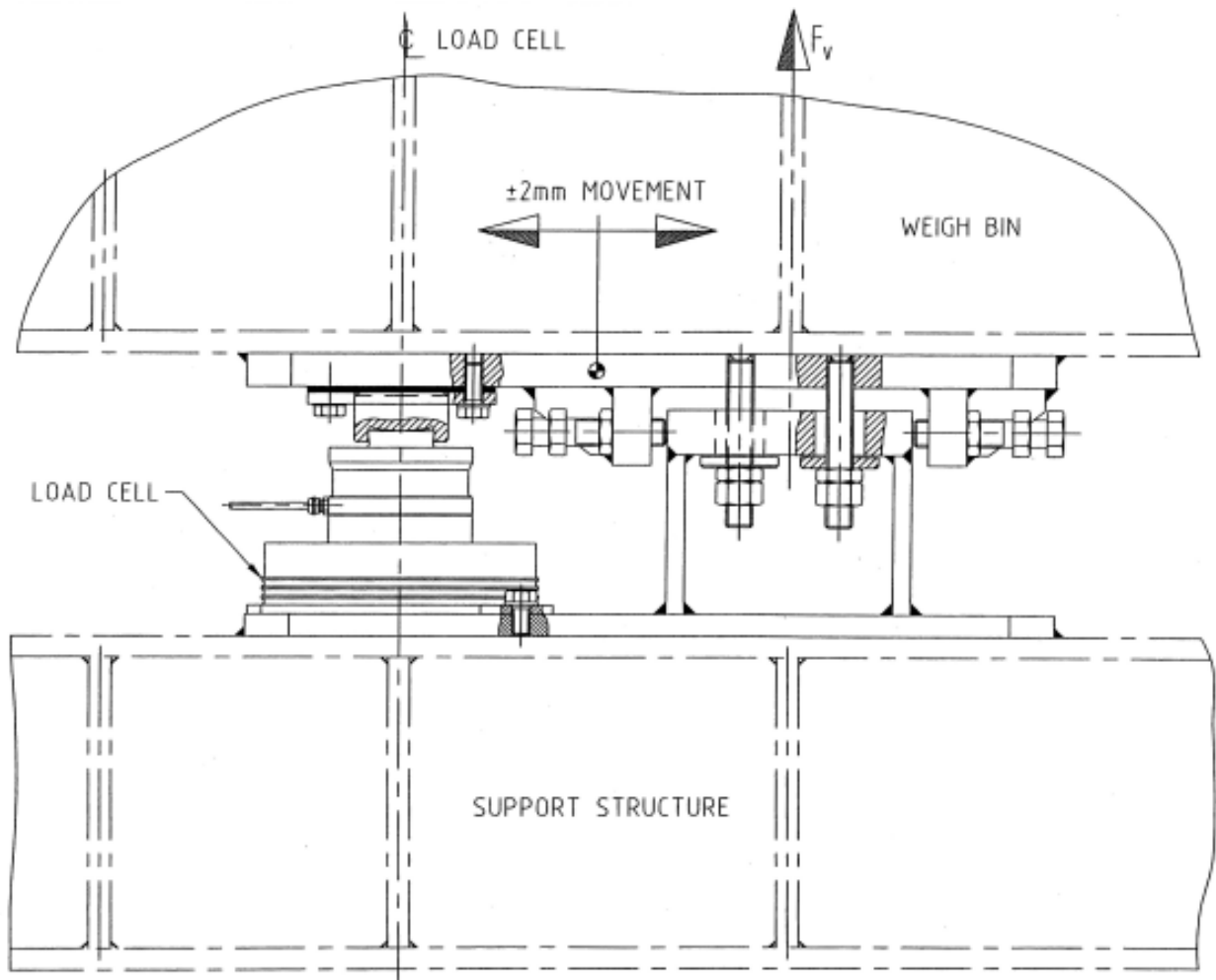
FIGURE 6/10B/70 - 1



Typical Schenck Model TL01 Hopper Weighing Instrument

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FIGURE 6/10B/70 – 2



Typical **Schenck** Model TL01 Hopper Weighing Instrument Load Cell Mounting

FIGURE 6/10B/70 – 3

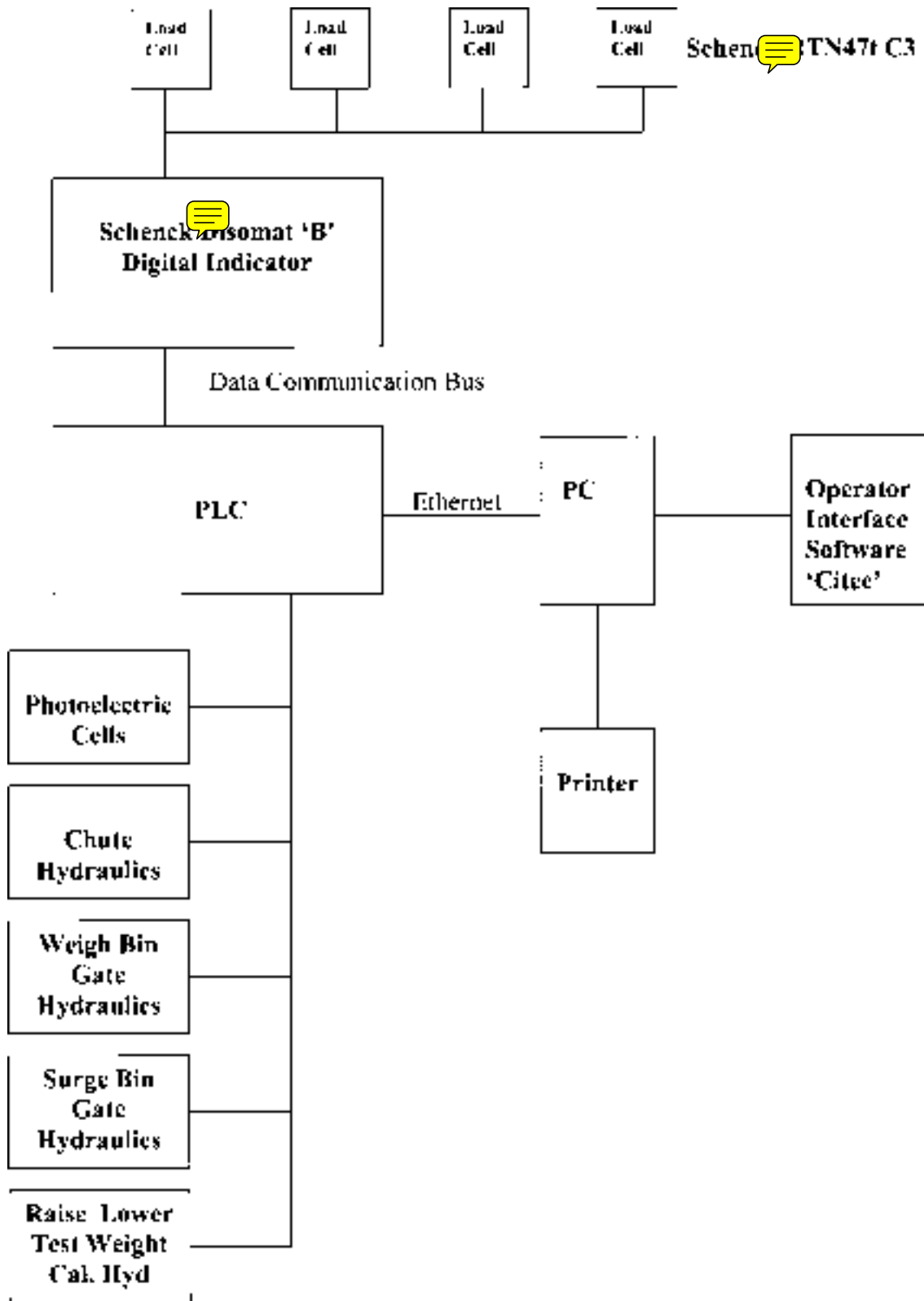


Diagram of Major Components – Variant 1