Australian Government
Department of Industry, Innovation and Science

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 6/14D/15

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.

Schenck Model 3BMP-12 Belt Weighing Instrument

submitted by Schenck Process Australia Pty Limited
65 Epping Road
North Ryde NSW 2013.

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use as a legal measuring instrument 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 50, *Continuous totalising automatic weighing instruments (belt weighers), Parts 1 and 2*, dated July 2004.

This approval becomes subject to review on **1/03/17**, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variants 1 to 3 approved – interim certificate issued	8/02/07
1	Pattern & variants 1 to 3 approved – certificate issued	7/05/07
2	Variant 4 approved – interim certificate issued	8/08/07
3	Variants 4 & 5 approved – certificate issued	14/01/10

Document History (cont…)

Rev	Reason/Details	Date
4	Pattern & variants 1 to 5 reviewed & updated – certificate issued	28/06/13
5	Figure 3 amended – certificate issued	08/10/19

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 6/14D/15' 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 Certificates No S1/0/A or No S1/0B.

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

Special: For the pattern and all variants

The submittor shall advise NMI in writing of the proposed location and specifications of each instrument prior to it being initially verified.

Instruments shall not be initially verified until the person intending to carry out the verification has been advised in writing by NMI of the location and suitability of the instrument.

Instruments must comply with all calculations provided in the Technical Schedule No 6/14D/15 attached herein.

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 6/14D/15

1. Description of Pattern **approved on 7/05/07**

The pattern is a Schenck model 3BMP-12 class 0.5 belt conveyor weigher of 800 t/h maximum flow rate, approved for use over a flow rate range of 20% to 100% of maximum flow rate.

The instrument is approved with a weigh length of 9 m and a belt speed of 4.6 m/s.

Means shall be provided to ensure that the conveyor cannot move in the reverse direction.

1.1 Basework (weighframe)

The model 3BMP-12 weighframe consists of 3 model BMP weighing modules in an in-line arrangement. Each BMP weighing module (Figure 1) has 2 idler rollers and uses a mounting in which the load is transferred to a single load cell by means of a weigh yoke arrangement.

Schenck model RTN 1t C3 load cells of 1000 kg capacity are used. The load cells are also described in the documentation of approval NSC S347.

The load cell and weigh yoke are secured by leaf spring parallel guides mounted on a carrying frame.

The weighing modules may be installed at an incline of up to 20^{o} from horizontal providing there is no relative movement between the product and the conveyor belt.

1.2 Belt Speed Sensor

Belt speed is sensed by a Schenck model FGA 20 RSLE tachometer (Figure 2a) which uses a pair of proximity switches to detect rotation of the friction wheel which is mounted on a rocker arm, and rests on the belt.

Alternatively a Schenck model FGA 24A tachometer (Figure 2b) may be used; this utilises a proximity switch to detect rotation of a disk attached to the take-up roller/pulley.

1.3 Computing and Totalising Unit

A Schenck Intercont Plus model FIP0401e integrator/totaliser (Figure 3a) with version FBW211 software is used. This may be housed in an additional cabinet (e.g. Figure 3b).

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

1.4 Verification Provision

Provision is made for the application of a verification mark.

1.5 Sealing Provision

Provision is made for the calibration adjustments to be sealed by placing a destructible adhesive label over the calibration switch access hole (Figure 3(a)).

1.6 Descriptive Markings and Notices

Instruments are marked with the following information, on one or more permanently attached nameplates:

Manufacturer's mark, or name written in full	…….
Indication of accuracy class	Class 0.5
Type designation (model number) of the instrument	…….
Serial number of the instrument	
Pattern approval mark for the instrument	NMI 6/14D/15
Maximum flow rate	Q_{min} =……. kg/h or t/h
Minimum flow rate	Q_{min} =……. kg/h or t/h
Minimum totalised load	$\sum_{min}$ =…..... kg or t
Maximum capacity of the weighing unit	Max =…….. kg or t
Totalisation scale interval	d =…..... kg or t
Belt speed	v =..... m/s
Weigh length	L = ... m
Temperature range	-10°C / 40°C
Designation of product(s) to be weighed (if not fixed by installation conditions)	…….

In addition to the above markings the instrument shall bear the inscription:

'Zero testing shall have a duration of at least ... revolutions'.

The number of revolutions in this statement shall be a whole number of revolutions (at least one) and of a duration as close as possible to 3 minutes.

2. Description of Variant 1 **approved on 7/05/07**

The pattern or variants with Schenck RTN # C3 series load cells of models and capacities as listed below: The load cells are also described in the documentation of approval NSC S347.

Model:	RTN 1t C3	RTN 2.2t C3	RTN 4.7t C3
Maximum capacity, E_{max} kg	1000	2200	4700
Maximum number of verification intervals	3000	3000	3000
Minimum value of verification interval, V_{min} kg	0.05	0.11	0.235

3. Description of Variant 2 **approved on 7/05/07**

The pattern or variants with the weighframe comprised of various arrangements of BMP weigh modules, which are described in clause **1.1 Basework** for the pattern. The weighframe model number is in the form xBMPy-z where:

- x represents the number of weigh modules in an in-line arrangement;
- y represents the number of weigh modules in a side-by-side arrangement; and
- z represents the belt width (z multiplied by 100 = belt width in mm)

Note: Where x or y is 1, it may be omitted from the model number (Figure 4).

Instruments may be fitted with belts in widths from 0.5 to 2.2 m.

4. Description of Variant 3 approved on 7/05/07

The pattern or variants of Class 0.5, 1 or 2, with various maximum and minimum flow rates, with weighframes of various capacities using approved load cells of various capacities.

Instruments may be of various weigh lengths, and with various belt speeds.

The minimum flow rate shall be not less than 20% of the maximum flow rate.

Included in this Technical Schedule is a set of calculations which should be used to determine the suitability of the load cells in a particular belt weigher.

Refer to the Special Conditions of Approval.

5. Description of Variant 4 approved on 8/08/07

Using a Schenck Intecont Plus model VEG 2061x (#) or a Schenck Intecont Opus model VEG 2062x (#) integrator/totaliser with version VBW software instead of the integrator/totaliser described for the pattern.

The models VEG 2061x (#) and VEG 2062x (#) are similar in appearance to the integrator/totaliser shown in Figure 3, including being sometimes housed in an additional cabinet (e.g. Figure 3b).

(#) Each integrator/totaliser may be fitted with output sockets (output interfacing capability) for the connection of auxiliary and/or peripheral devices. The ‘x’ suffix in the model numbers above may be any digit from 0 to 5 depending on the communication module fitted, e.g. ‘0’ means no module is fitted, while ‘4’ means that an Ethernet connection is fitted.

6. Description of Variant 5 approved on 17/07/09

The pattern or variants with a Schenck model FGA 30R2 tachometer which is similar to the tachometers described for the pattern but encapsulated in a different housing (Figure 5).

TEST PROCEDURE No 6/14D/15

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

Maximum Permissible Errors

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

The maximum permissible errors for belt weighers are:

Class 0.5: ±0.25%
Class 1: ±0.5%
Class 2: ±1.0%

CALCULATIONS

1. Load cell(s) – number of verification intervals

Class 0.5: $n_{max} \geq 1500$

Class 1: $n_{max} \geq 1000$

Class 2: $n_{max} \geq 500$

2. Load cell(s) – capacity

$$E_{max} \geq \frac{Max + DL}{N \cdot r}$$

3. Temperature effect on the minimum load on the load cell(s)

Class 0.5: $$v_{min} \leq \frac{0.00025 \cdot Max}{r \cdot \sqrt{N}}$$

Class 1: $$v_{min} \leq \frac{0.0005 \cdot Max}{r \cdot \sqrt{N}}$$

Class 2: $$v_{min} \leq \frac{0.001 \cdot Max}{r \cdot \sqrt{N}}$$

where:

E_{max} = Maximum capacity of the load cell(s)

Max = Capacity of the weighframe at maximum flow rate

$$= \frac{Q_{max} \cdot L}{V}$$

DL = Dead load of weighframe

N = Number of load cells supporting weighframe

r = Lever ratio ($r = 1$ if system does not use levers)

L = Weigh length

V = Belt speed

Q_{max} = Maximum flow rate

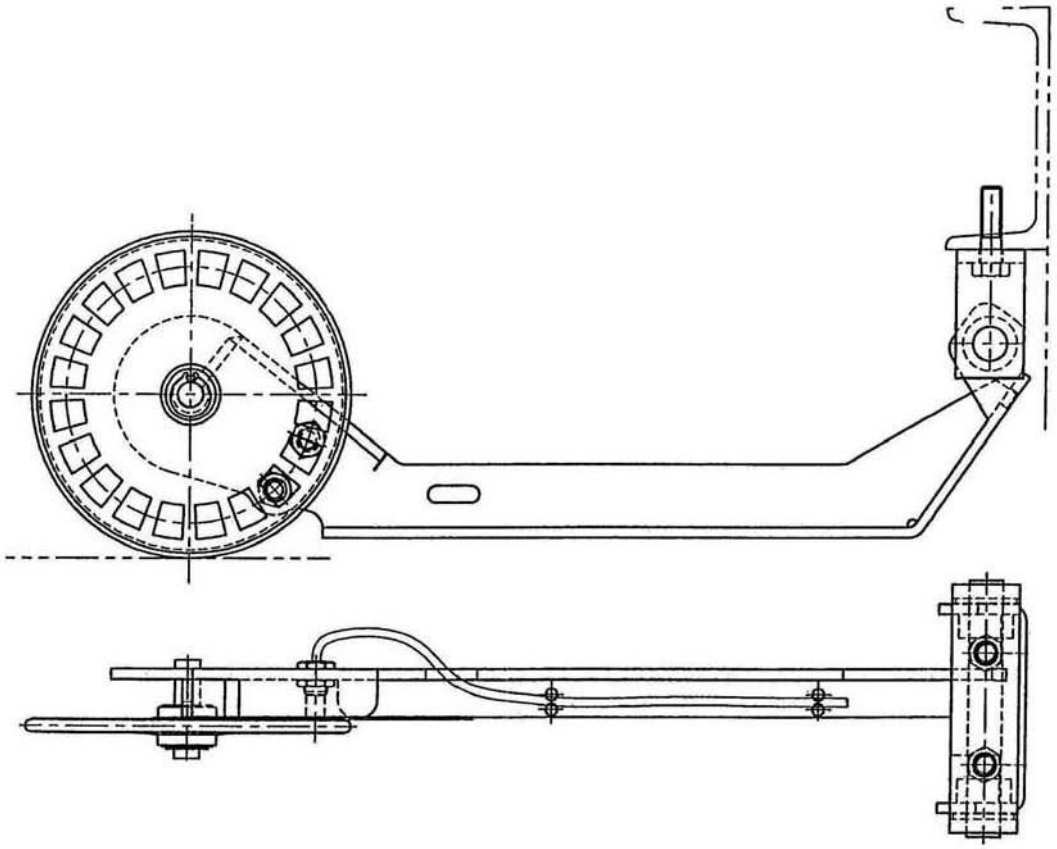
v_{min} = Minimum value of verification interval for the load cell(s)

n_{max} = Maximum number of verification intervals for the load cell(s)

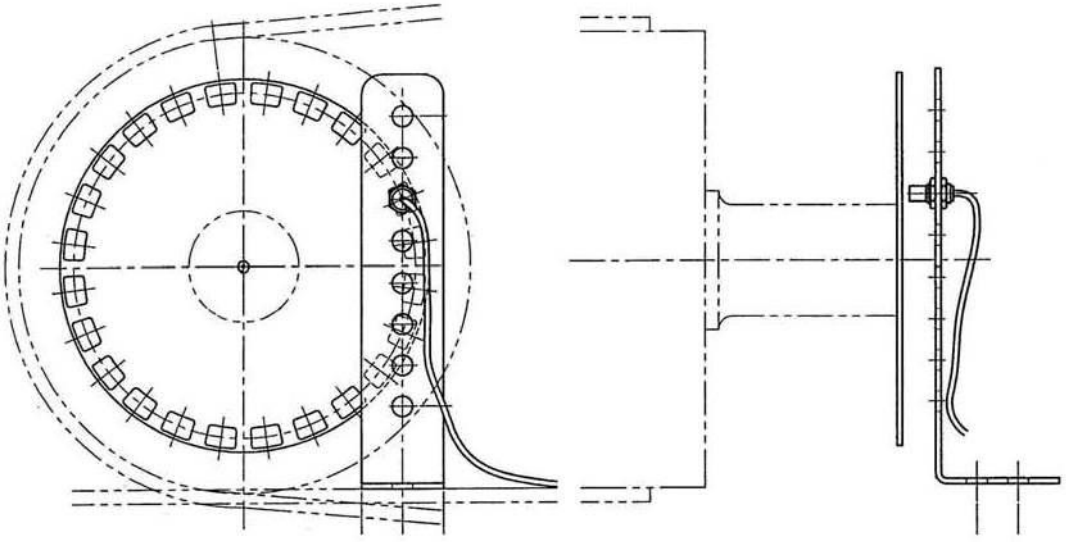
FIGURE 6/14D/15 – 1

Schenck Model BMP Weighing Module

FIGURE 6/14D/15 – 2



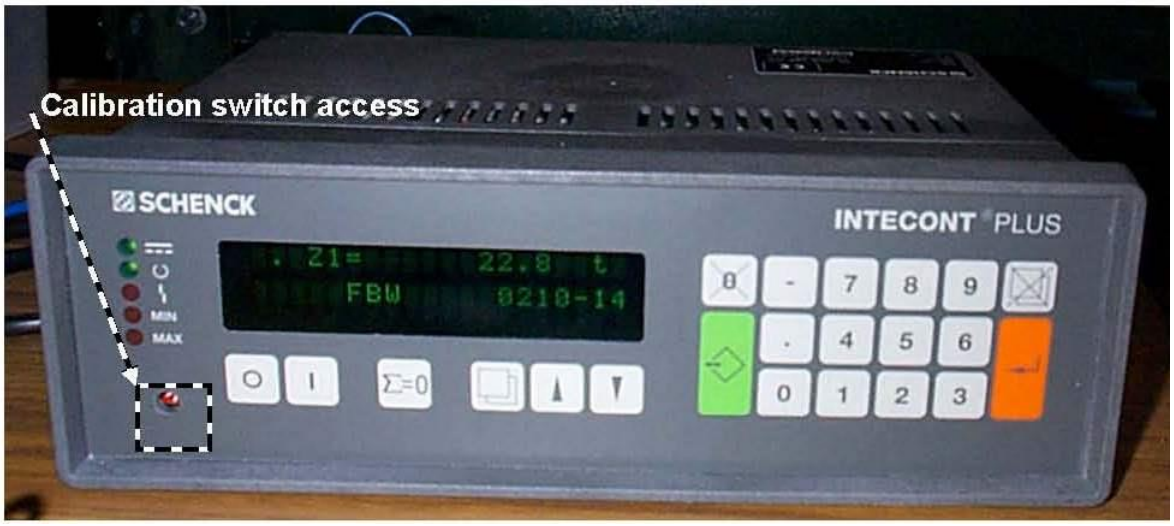
(a) FGA 20 RSLE Speed Sensor



(b) FGA 24A Speed Sensor

Speed Sensors

FIGURE 6/14D/15 – 3

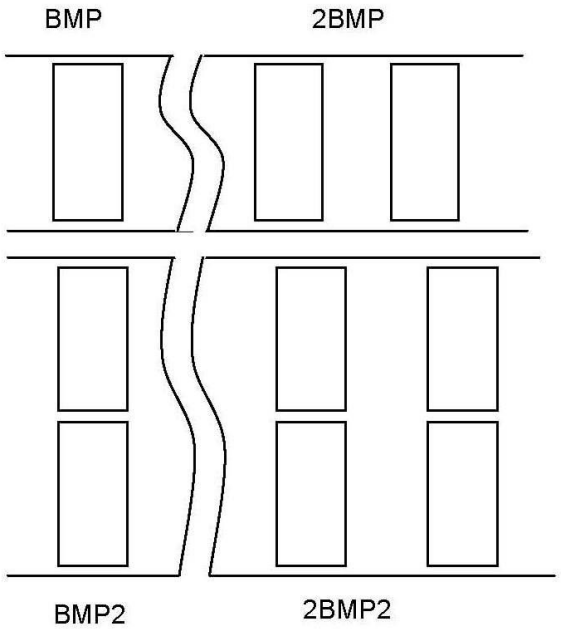


(a) Intecont Plus Indicator (including Typical Sealing)

(b) Intecont Plus Indicator in Additional Housing

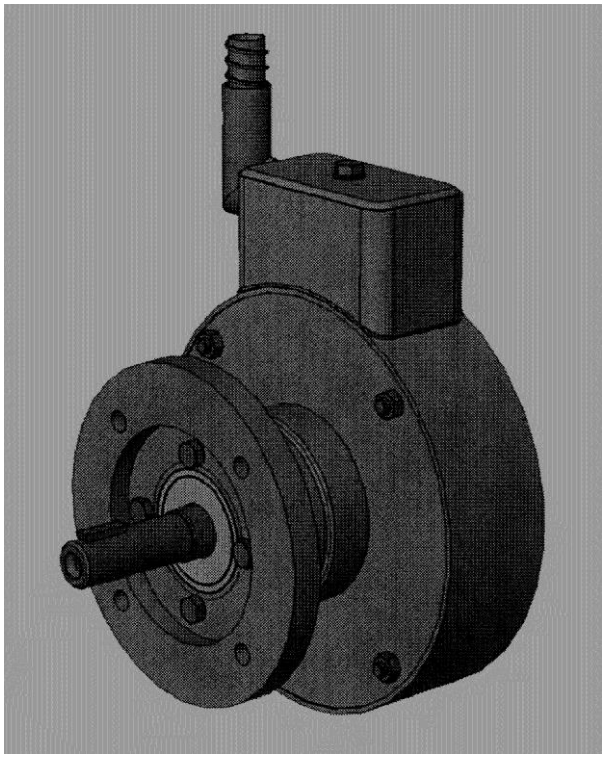
Intecont Plus Indicator in Various Housings

FIGURE 6/14D/15 – 4



Weighframe Model Naming Examples

FIGURE 6/14D/15 – 5



Schenck Model FGA 30R2 Tachometer (Speed Sensor)

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