



The National Weights & Measures Laboratory

TEST CERTIFICATE NUMBER GB-1190

Issued by: National Weights and Measures Laboratory
Stanton Avenue
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United Kingdom

Notified Body Number 0126

In accordance With Paragraph 8.1 of the European Standard on Metrological Aspects of Non-automatic Weighing Instruments EN45501:1992. The applied error fraction p_i with reference to paragraph 3.5.4 of this standard is 0.5.

Applicant: Electronic Weighing Services
Lytton Street
Stoke-On-Trent
Staffordshire, ST4 2AG
United Kingdom

In respect of: The model of an **Indicating Device** tested as a part of a weighing instrument.
Manufacturer: Electronic Weighing Services
Type: Apex Junior AJ02 and AJ03

Characteristics: Suitable for a non-automatic weighing instrument with the following characteristics:
 $n \leq 6000$ for Class III and IIII instruments

Description and documentation: The Indicating device is described in the Descriptive Annex. Documents appertaining to this test certificate are held by the National Weights and Measures Laboratory.

Remarks: The Indicator has been tested and found to conform to the relevant parts of EN45501 and WELMEC Guide 2.1. A summary of the tests performed in support of this Test Certificate is provided in the Appendix to the Descriptive Annex.

Signature:

C.S.C. Munteanu

C S C Munteanu
for Chief Executive
National Weights and Measures Laboratory

Date: 15 November 2004
Reference: STD 11297

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Descriptive Annex

1 INTRODUCTION

This indicating device is designated the Apex Junior AJ02 and AJ03. The difference between model AJ02 (Figure 1) and AJ03 (Figure 2) is that the AJ02 utilises a red LED whereas the AJ03 utilises a LCD module, both models may be optionally mains powered via a transformer or battery power.

2 FUNCTIONAL DESCRIPTION

2.1 Devices

The indicating device has the following devices:

- Semi-automatic zero setting device
- Zero tracking device
- Zero indicator
- Semi-automatic tare balancing device
- Pre-set tare device
- Net indicator

2.2 Construction

The indicator enclosure is made of stainless steel and includes a removable rear cover. It may also include a wall mounting bracket or bench mounting stand. The front section houses the indicator display/keyboard, the main board, power supply board and option boards are housed internally

The underside of the stainless steel enclosure is fitted with watertight glands providing access for load cell interface, power cables. Serial and relay I/O interface; alternatively these may be substituted via plug/socket arrangements. The display consists of six seven segment modules that may be of LCD or LED construction and include zero and net enunciators.

There are up to five dedicated function keys on the keyboard. That performs the following functions:

- POWER switch on /display battery voltage whilst on*
- ZERO/OFF semi-automatic zero setting device/switch off if key is held.
- TARE initiates/cancels the semi- automatic subtractive tare device
- PRINT initiates the print command.
- MODE /ENTER Toggles between available applications/stores data

* with calibration link fitted displays x10 division

2.2.1 The indicator may be fitted with any or all of the following optional devices

- (1) Bi directional RS232C
- (2) Time/date module
- (3) 8K x 8 bit non volatile memory (FRAM)

2.2.2 The indicator may additionally be configured to allow up to 2 remote I/O interfaces to be connected for driving relays, motors etc. and to receive inputs from switches, photocells etc.

2.3 Functions

2.3.1 Power up

At switch on a display test routine is initiated, where each module displays eight. This routine lasts for approximately 3 seconds, after which the indicator will indicate the previous zero value.

There is no initial zero setting function.

2.3.2 Display

The indicator will display a weight value up to Max +9 e. Any weights above this will result in "TOP" being displayed to the operator.

Negative weight values will be indicated with a minus sign.

2.3.3 Semi-automatic zero setting device

The ZERO key sets a new reference value. A successful zero can only be set if the weight value is stable. Zero is indicated by the "zero" enunciator being illuminated.

The zero-setting range is $\leq 4\%$ of maximum capacity. Outside of this range the selection will result in "F1" being displayed to the operator.

2.3.4 Zero tracking device

Zero tracking will operate when the indication is at zero, or at a negative Net value equivalent to Gross zero; and when the weight display is stable and at a rate of ≤ 0.5 d/s within 4 % of maximum capacity.

2.3.5 Semi-automatic tare device

The TARE key will initiate the semi-automatic subtractive tare device. Maximum tare effect is equivalent to maximum capacity. Selection of the TARE key when a tare is present will result in the tare being cancelled,

2.3.6 Pre-set tare device (optional function selectable)

A pre-set tare value (up to maximum capacity) can be manually entered by selecting the mode key any existing tare value will be cleared, the preset tare may be input by selecting the

“print/+” key in order to increment the least significant digit and the “tare/left arrow” key in order to shift the digits left. The “ENTER” key may be used to store the tare value and the “zero” key may be used to clear the indicated value prior to entering it.

2.4 Drawings

Drawing No.	Description
AJMCU	Main PCB circuit diagram
AJPSU	PSU circuit diagram
AJAD	Analogue to digital circuit diagram

3 TECHNICAL CHARACTERISTICS

3.1 Technical data

Power supply	110-240 Vac 50/60 Hz or 9-12v dc
Maximum number of scale intervals	6000
Load cell excitation voltage	5 Vdc
Minimum load cell impedance	35 Ω
Maximum load cell impedance	500 Ω
Minimum input voltage per verification scale interval	1 μ V
Measuring range minimum voltage	6 mV
Measuring range maximum voltage	16 mV
Fraction of maximum permissible error	$P_{ind} = 0.5$
Operating temperature range	- 10 °C to + 40 °C
Load cell cable (junction box to indicator)	6 core with braided outer screen. 0.5 mm ² per core, flexible PVC overall jacket Maximum length = 100 m

4 INTERFACES

The instrument has the following protected interfaces:

- Load cell connection
- RS232C
- Trip/control I/O

5 SOFTWARE

5.1 Access to the calibration routine is restricted via a jumper link situated on the main pcb and designated “cal”, with the link fitted access is gained with the unit switched off by pressing the power key whilst holding pressed the zero key for a period of two seconds. Whilst the cal link is fitted selecting the number 1 key will result in a x 10 division display.

5.2 User Menu

The user may configure optional functions via a user menu, access to the user menu is achieved with the unit switched off by pressing the power key whilst holding pressed the tare key for a period of 3 seconds the existing menu settings are displayed to the operator and a prefix “t” indicates that the software is the legal version.

6 LOCATION OF CE MARK AND INSCRIPTIONS

6.1 The instrument shall bear the following legends near the display of the weighing result:

Class
Max
Min
e =

6.2 The instrument shall bear the following legends:

CE mark
Green M
Class
Serial number
Manufacturers mark or name
Certificate number

7 LOCATION OF SEALS AND VERIFICATION MARKS

7.1 The CE mark, Green M and Certificate number are located on the right hand side of the indicator housing. The data plate will be mounted in such a manner that it is easily accessible and clearly visible in its regular operating position. The CE mark shall be impossible to remove without damaging it. The data plate shall be impossible to remove without it being destroyed.

The markings and inscriptions shall fulfil the requirements of Paragraph 1 of Annex IV of the Directive 90/384/EEC.

7.2 Components that may not be dismantled or adjusted by the user (e.g. load cell connections) will be secured by either a wire and lead seal or tamper evident label and securing mark. The securing mark may be either:

- a mark of the manufacturer and/or manufacturer’s representative, or
- An official mark of a verification officer.

8 ALTERNATIVES

8.1 The Apex Excelsior Digital Indicator

The indicating device has the following extra devices:

- Gross indicator
- Motion indicator

- Relay pattern indication
- Optional Under Pass Over indication

8.1.1 Construction

The indicator enclosure is made of stainless steel and includes a removable rear cover it may also include a wall mounting bracket or bench mounting stand. The front section houses a six module seven segment led display, a two line 20 character back lit LCD display, eight LED enunciators and a 0 to 9 text keyboard with six function keys the main board, power supply board and option boards are housed internally.

There are up to six dedicated function keys on the keyboard. That performs the following functions

- TARGET/CODE Initiates a code or target value entry
- ZERO Semi-automatic zero setting device.
- TARE Initiates/clears the semi- automatic subtractive tare device
- START/PRINT Initiates the print command or initiates a sequence start
- MODE Toggles between available applications
- ↵ Enter key initiates a preset tare value entry or stores data

The indicator may be configured to allow up to 16 remote I/O interfaces to be connected for driving relays, motors etc. and to receive inputs from switches, photocells etc.

8.1.2 Functions

8.1.2.1 Pre-set tare device (optional function selectable)

A pre-set tare value (up to maximum capacity) can be manually entered by selecting the enter key any existing tare value will be cleared, the preset tare may be input via the 0-9 keys followed by “enter”

8.1.2.2 Enunciators

The “G” LED will illuminate whilst the display is in gross mode, the “N” LED will illuminate whilst the display is in net mode and the motion LED will illuminate whilst the display is unsteady

8.1.3 Software

8.1.3.1 Access to the calibration routine is restricted via a jumper link situated on the main pcb and designated “cal”, with the link fitted access is gained with the unit switched off by restoring power whilst holding pressed the mode key until the unit enters the calibration routine. Whilst the cal link is fitted selecting the number 1 key will result in a x 10 division display.

8.1.3.2 User Menu

The user may configure optional functions via a user menu, access to the user menu is achieved with the unit switched off by restoring power whilst holding pressed the tare key

until the existing menu settings are displayed to the operator and a prefix “t” indicates that the software is the legal version.

9 ILLUSTRATIONS

- Figure 1 Indicator general view AJ02
- Figure 2 Indicator general view AJ03
- Figure 3 Apex Excelsior Digital Indicator

11 TEST CERTIFICATE HISTORY

ISSUE NO.	DATE	DESCRIPTION
GB-1190	15 November 2004	Test certificate first issued.
No revision issued	-	-

APPENDIX TO DESCRIPTIVE ANNEX

TESTS CARRIED OUT

The following tests were performed with the indicator connected to a loadcell simulator or to a weighing platform.

EN45501 Ref	Test	Report number(s)
A.4.2	Checking of zero	TR00489
A.4.6.1	Weighing accuracy with tare	TR00489
A.4.10	Repeatability	TR00489
A.4.12	Stability of equilibrium	TR00489
A.5.2	Warm-up test	TR00489
A.5.3.1	Weighing performance at static temperatures	TR00489
A.5.3.2	Temperature (effect on no load)	TR00489
A.5.4	Power voltage variation	TR00489
B.2.2	Damp heat steady state	TR00489
B.3.1	Short time power reductions	TR00489
B.3.2	Bursts	TR00489
B.3.3	Electrostatic discharges	TR00489
B.3.4	Electromagnetic susceptibility	TR00489
B.4	Span stability	TR00489



Figure 1 Apex Junior AJ02 LED Display



Figure 2 Apex Junior AJ03 LCD Display



Figure 3 Apex Excelsior Display Unit