

WESTON



ELECTRICAL

INSTRUMENTS

FOR AIRCRAFT



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GENERAL INFORMATION

Weston Aircraft Instruments and Accessories are supplied to the Ministry of Aviation and to manufacturers of military and civil aircraft throughout the world.

Sangamo Weston Limited are a Design Approved Firm, and the engineers at our Works and Branch Offices are available to discuss any problems and to give any assistance which may be required in connection with these products. Inquiries at any one of the addresses given below will receive prompt attention.

Prices of all instruments and accessories will be quoted on application.

SANGAMO WESTON LIMITED

Head Office and Works:

ENFIELD, MIDDLESEX, ENGLAND

Telephone: 01-366 1100

Telegrams: "Sanwest Enfield"

Telex: 24724

Other Factories at:

**PORT GLASGOW, RENFREWSHIRE . FELIXSTOWE, SUFFOLK
BOGNOR REGIS, SUSSEX**

LONDON AIRPORT DEPOT:

ROOM 12, BUILDING 223, L.A.P. NORTH, HOUNSLOW, MIDDLESEX

Telephone: SKYPORT 9417

Branches:

*LONDON: St. George's Court, 22/26 New Oxford Street, London, W.C.1	01-242 4971
*GLASGOW: 201 St. Vincent Street, Glasgow, C.2	Central 6208
*MANCHESTER: Shepley Industrial Estate, Audenshaw, Manchester	Denton 4411
LEEDS: 21 Bond Street, Leeds, 1	Leeds 30867
LIVERPOOL: Sheffield Buildings, 89 Victoria Street, Liverpool	Central 0230
*BIRMINGHAM: Phoenix Chambers, 90 Colmore Row, Birmingham, 3	Central 0691
NOTTINGHAM: Clumber Chambers, 8 Thurland Street, Nottingham	Nottingham 42403
BRISTOL: 23 Colston Street, Bristol, 1	Bristol 21781
*SOUTHAMPTON: 14 Portland Terrace, Southampton	Southampton 23328

** These branches specialise in matters connected with the Instrument Division of Sangamo Weston Limited.*



WARRANTY FOR AIRCRAFT EQUIPMENT

1. This Warranty is offered by Sangamo Weston Limited (hereinafter referred to as the "Seller") to the manufacturer of the aircraft (hereinafter referred to as the "Buyer") to which Seller's equipment (forming the subject of this Contract) may at any time be fitted and to the Operator of such aircraft if purchased new from Buyer. It is also applicable to equipment purchased by the Operator direct from the Seller. Any reference in this Warranty to "equipment" includes any spare parts supplied at any time for such equipment.

2. Seller warrants that, subject to all the terms of this Warranty, the equipment including all items thereof will conform to applicable drawings and specifications and be free from defects due to:

- (i) faulty material, or
- (ii) faulty workmanship, or
- (iii) faulty design on the part of Seller and/or Seller's suppliers having regard to the state of the art at the time of the design or at the time of acceptance by Seller of the Order, whichever is later, and be fit for the intended purpose provided that prior to Seller's acceptance of the Order Buyer has disclosed to Seller the intended purpose and, on request, all particulars of installation and operation relevant thereto.

3. This Warranty shall take effect immediately after acceptance of the equipment by Buyer or Operator and remain in force for:

- (i) Twenty-four calendar months after the original equipment shall have first been despatched which period shall include not more than twelve months' or 3,000 hours' service in aircraft, or
- (ii) Twelve calendar months after delivery to the Operator of the aircraft in which the original equipment shall have been installed, or
- (iii) Three thousand flying hours,

whichever of the three periods terminates the earliest and relates to all such defects discovered within this period and notified to Seller within ninety days of discovery, provided the equipment has been used, handled, stored, maintained, installed and operated in accordance with sound aviation practice, including any instructions issued by Seller. This Warranty shall not extend to normal wear and tear nor to items which have been subjected to any alteration not authorised by Seller or experimental running or any type of operation or use outside that for which the production equipment is intended nor to items from which Seller's trade mark or serial number has been altered, removed or obliterated.

4. For the purpose of this Warranty an item shall not be regarded as defective in design merely because some modification or alteration thereof is required to be made by an Airworthiness Authority after delivery of the equipment.

5. Seller will without charge and subject to this same Warranty repair any such defective item or at its option replace with a similar item but free from defect if in either case the item is proved to Seller's satisfaction to be defective and under Warranty, in which case Seller will also pay reasonable packing and transportation charges. Any item alleged to be defective and under Warranty shall be returned, identified and properly packed, to Seller.

6. The provisions of this Warranty are in substitution for and exclude all express or implied statutory or other Warranties, Guarantees, Conditions or liabilities (whether as to fitness, quality, standard or workmanship or otherwise) and the provisions hereof shall override any alleged representation or collateral agreement to the contrary, except such an agreement in writing signed by an authorised representative of each party hereto. Save as provided herein, Seller shall be under no liability whatsoever in tort or in contract or otherwise to Buyer or to the Operator at any time in respect of the equipment or any item thereof.



The purpose of this catalogue is to present current information on indicators and accessories manufactured by Sangamo Weston Limited for the Aviation Industry.

Due to the wide range of products it is impossible to give specific details of all the ranges that can be covered, but in order to make reference as easy as possible the catalogue has been sectionalised.

These sections are arranged in such a way that each covers a particular group of instruments which are available for a specific application. A separate section, with cross references, contains fixing diagrams. Separate Description and Installation sheets are also available for most models. These are not contained in this catalogue but may be obtained upon request from Head Office and Works.

MODEL AND SPECIFICATION NUMBERS

All Weston instruments are coded by a three-part code.

The three parts of the code consist of:

Model Number	i.e. S.99
Form	„ 5
and Sub-Specification	„ 11J

The first two parts of the code generally cover the mechanical design such as size and shape, whereas the last set of figures (Sub-Specification number) including the suffix letter, determines the electrical and detail specifications such as sensitivity, dial presentation, type of pointer, electrical connections.

The suffix letter to the Sub-Specification number indicates the Modification Standard of the unit. These letters are used to record minor changes which in no way affect the electrical or mechanical interchangeability of the unit. Any change in dial presentation or thread size, for example, automatically changes the third reference number of the code.

The complete code number is a master record index which provides sufficient information to identify the unit and its components.

Modern thermocouples are coded in the manner described above.

Early thermocouples and leads, however, had a special code although the system of using form and sub-specification numbers was used.

Form numbers listed below indicate the thermocouple and lead materials.

1. Copper/Constantan	5. Copper
2. Ni Ch/Ni Al	6. Constantan
3. Nickel Chromium	7. Iron/Constantan
4. Nickel Aluminium	8. Iron

All thermocouple references were preceded by the letter "T" and a number which represented the physical shape. A typical example is as follows:

T30.7.11 where T30 = Gasket type

7 = Iron/Constantan

11 = Sub-Specification number

Thermocouple compensating leads are coded by numbers following the letter "L". The first number represents the lead material and the last number the specification which defines all the special details.

Components and accessories are identified either by part-number, for example 177777, or by the reference ACC., followed by a number.

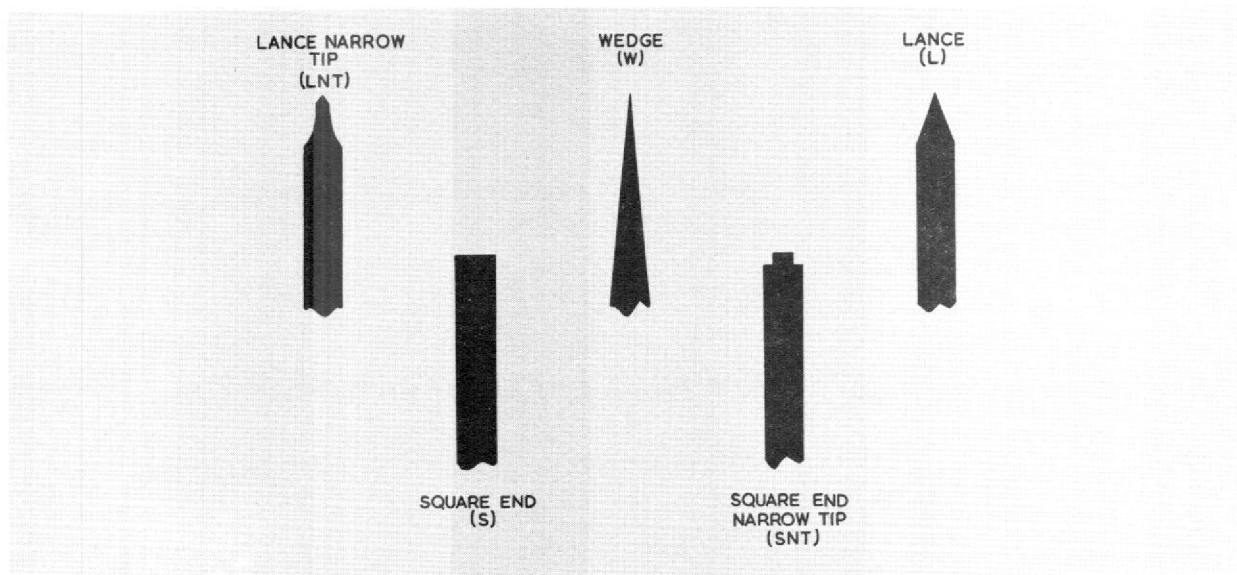
ELECTRICAL CONNECTIONS

The majority of Weston Instruments and accessories mentioned in this catalogue are offered either with screw terminals or plug and socket connectors. Where possible alternative types of connectors are listed and for ease of reference these are coded as follows:

<u>Code</u>	<u>Terminal or Connector</u>	<u>Mating Terminal or Connector</u>
A1	No. 2BA Screws with captive washers	"AMP." ring tags (Stud size 10)
A2	No. 2BA Phillips Head Screws	Ditto
A3	No. 4BA Screws with captive washers	"AMP." ring tags (Stud size 5-6)
A4	No. 4BA Phillips Head Screws	Ditto
A5	No. 6BA Screws	"AMP." ring tags (Stud size 3-4)
A6	No. 6 BA Screws with captive washers	"AMP." ring tags Type 22-16
B2 and B3 ..	No. 6 UNC Screws with captive washers	"AMP." ring tags (Stud size 5-6)
B4	No. 4 UNC Screws with captive washers	"AMP." ring tags Type 22-16
C1	2-pin Cannon Plug GS02-12S-3P-GB070	Cannon Connector AN-CA06-ER-12S-3S
C2	2-pin Cannon Plug GS02-12S-3P-002	Cannon Connector AN-3106-12S-3S
C3	3-pin Cannon Plug GS02-10SL-3P-003	Cannon Connector AN-3106-10SL-3S
C4	3-pin Cannon Plug MC.14H-8-3P.N.	Cannon Connector M.C.11E-8-3S.N.
C5	3-pin Cannon Plug MS.3102A-18-5P	Cannon Connector M.S.3106A-18-5S
C6	5-pin Cannon Plug GS02-14S-5P-003	Cannon Connector AN-3106-14S-5S
C7	5-pin Cannon Plug GS02-16S-8P-003	Cannon Connector AN-3106-16S-8S
C8	6-pin Cannon Plug MS.3102A-14S-6P	Cannon Connector MS-3106A-14S-6S
C9	6-pin Cannon Plug MC.14H-10-6PN	Cannon Connector M.C.11E-10-6SN
C10	7-pin Cannon Plug GS02-16S-1P-003	Cannon Connector AN-3106-16S-1S
C11	10-pin Cannon Plug MS.3102A-18-1P	Cannon Connector AN-3106A-18-1S
C12	10-pin Cannon Plug GS02-18-1P-003	Cannon Connector MS-3106E-18-1S-003
D1	6-pin Hellerman Plug CDS.600E-10-6P-003	Hellerman Connector C.D.B.06E-10-6S
E1	2-pin Plessey Plug 2CZ.111223	Plessey Connector 2CZ.111230
E2	4-pin Plessey Plug CZ.48994	Plessey Connector CZ.49016
E3	6-pin Plessey Plug CZ.48995	Plessey Connector CZ.49017
E4	6-pin Plessey Plug 2CZ.84385	Plessey Connector 2CZ.84411
E5	12-pin Plessey Plug 10 H/Z 560150	Plessey Connector CZ.49126

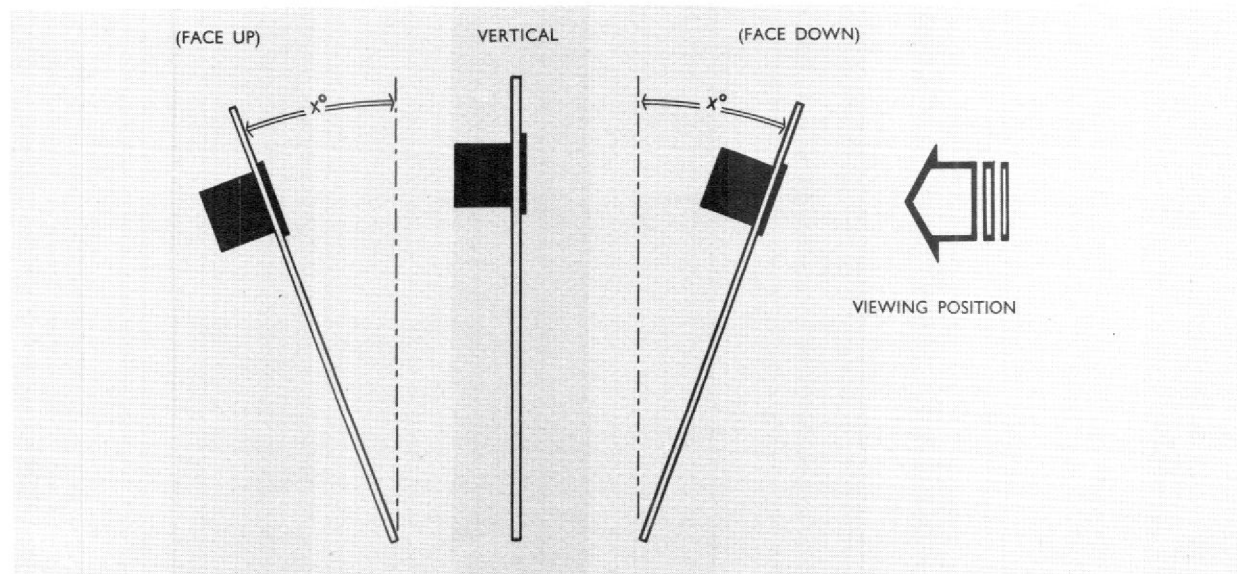
POINTERS

The following terms and abbreviations are used to determine the shape of indicator pointers. The type of pointer fitted as standard is indicated in the table in the relevant sections.



CALIBRATION OF PANEL-MOUNTED INDICATORS

Special calibration is required for indicators which are to be mounted and used away from the vertical position. The following terms will be used to determine the attitude of the panel-mounted indicators.



Instruments may also be calibrated for use in the horizontal plane.

Unless advised to the contrary, indicators will be balanced and calibrated for use in the vertical position.



DIAL PRESENTATION

Three terms are used to determine dial presentation of indicators. These are:

<i>PHOTOGENIC</i>	White Markings on matt black background (Standard).
<i>FLUORESCENT</i>	Fluorescent markings on matt black background.
<i>BLACK ON WHITE</i>	Black markings on matt white background.

Coloured bands or sectors can be incorporated when necessary.

TYPE APPROVAL

G.D.S. 1000 (General Design Specification)

This specification relates to aircraft indicators and accessories where environmental testing as defined in its contents is considered to be a suitable criterion for acceptance and approval of the item.

G.D.S. 1000 should be used in conjunction with the relevant Sangamo Weston "Specification and Declaration of Performance" (S.D.P.) which provides detailed information on the particular item.

Copies of the Specification G.D.S. 1000 are available to departments concerned with the approval and testing of Weston instruments and accessories and may be obtained upon request from our Head Office and Works.

S.D.P. (Specification and Declaration of Performance)

When read in conjunction with G.D.S. 1000 this single-sheet document will provide information required for approval, quality and production testing of the item. A reduced-size specimen copy S.D.P. is shown on page 9 and it will be seen that the document carries its own fixing and wiring diagram together with other information considered necessary for the correct installation of the item. In addition to declaration and performance data the document incorporates its own Form 100D which generally meets the requirements of M.O.A. AvP25 procedure.

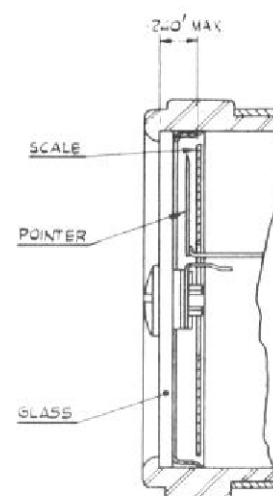
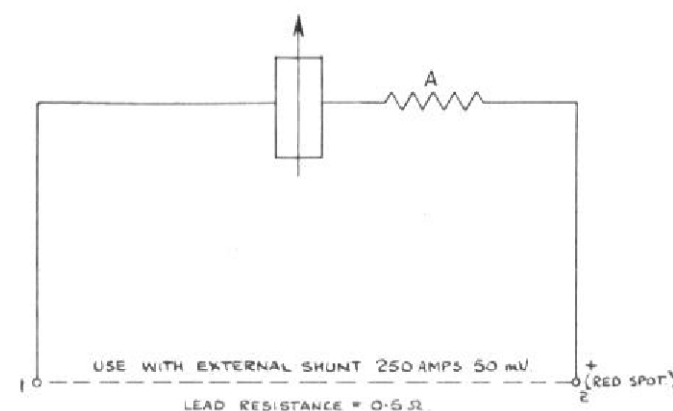
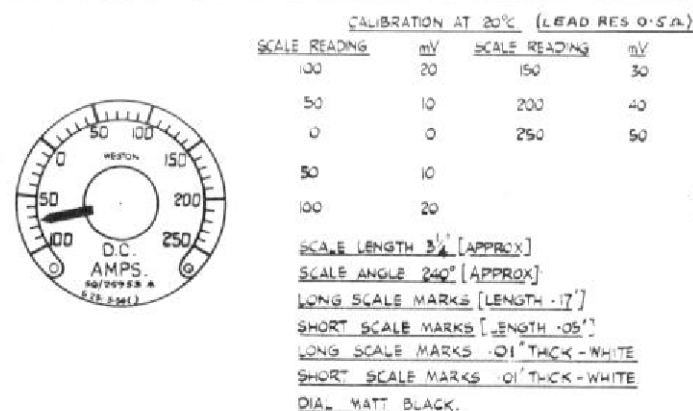
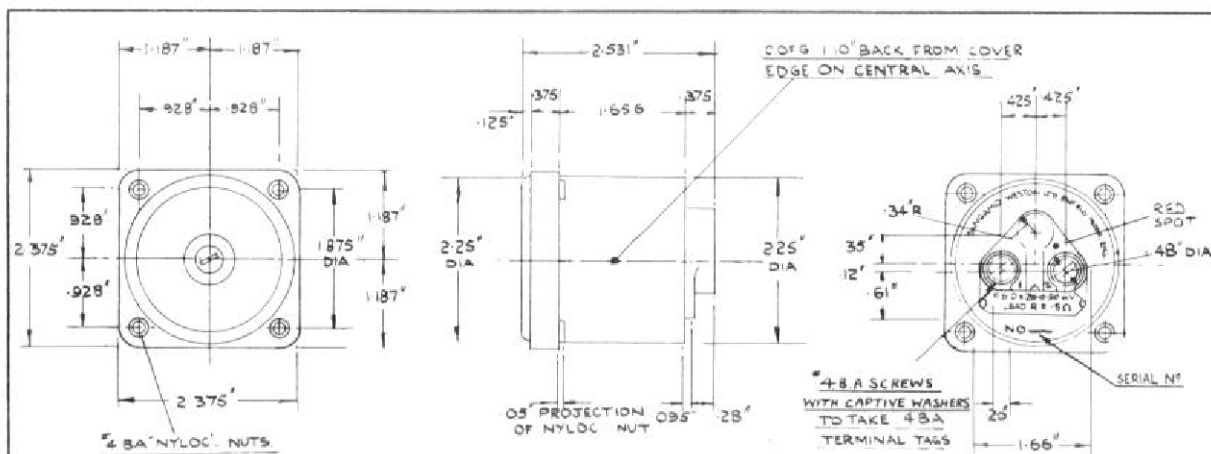
A declaration meeting the requirements of the Air Registration Board together with approval references is included either on the S.D.P. document or on an appendix attached to the document.

Models approved by the Air Registration Board have been allocated approval reference numbers and these are listed in Section 30 of this catalogue.

Where new items, not covered by a Specification and Declaration of Performance document, are either being supplied or negotiated, it is very often necessary to issue a part document (S.D.P.); the left-hand side completed only.

IMPORTANT NOTICE

All information contained in this catalogue is subject to change without prior notification.



PERFORMANCE DECLARATION AND TEST REQUIREMENTS

To be read in conjunction with Sangamo Weston general design Specification No. 1000.
 CLAUSE NUMBERS REFER TO SECTION B

Test	Clause No.	Category	Particular Test (see note)	Requirement (if any)
Visual Examination	3.1.1	III		SHALL COMPLY
Weight	3.2.1	I		12 OZS (MAX)
Balance	3.3.1	III		2% (i.e. 7 AMPS)
Sealing				NOT APPLICABLE
Accuracy	3.5.1	III		2% (i.e. 1.4 mV)
Panel Effect				NOT APPLICABLE
Fluorescent Brightness				NOT APPLICABLE
Screening	3.8.1	I		2% (i.e. 1.4 mV)
Pivot Stick	3.9.1	III		2% (i.e. 7 AMPS)
Power Consumption	3.10.1	I		10 mA (MAX)
Full Load	3.11.1	I		SHALL COMPLY
Temperature Coefficient	3.12.1	II		± 0.25% PER °C
Overload	3.13.1	II		SHALL COMPLY
Angular Acceleration	3.14.1	I		± 20% (i.e. 70 AMPS)
Damping	3.15.1	II		± 3 OVERSHOOTS
High Voltage	3.16.1	III		1000 R.M.S.
Insulation Resistance				
1) Each Mvmt. to case	3.17.1	III		20 MEGOHMS
2) Between Mvmts.				NOT APPLICABLE
Compass Interference	3.18.1	I		± 15 INCHES FOR 1° DEFLECTION
Voltage and/or Frequency Variation		I		NOT APPLICABLE
Acceleration	3.20.1	I		
1) During Operation				3g (CHANGE 10 TIMES)
2) Subsequent Operation				13g (ACCURACY ± 14 mV)
3) Security of mounting				25g
Bumping	3.51.1	II		SHALL COMPLY
Vibration	3.52.1	I		
1) Resonance Search				SEE CONDITIONS OF USE
2) Endurance				
Life	3.53.1	I		SHALL COMPLY
Climatic		I		
1) Cycling	3.76.1 & 2			PERFORMANCE NOT IMPAIRED
2) Fungus Growth	3.76.3 & 4			NOT APPLICABLE (NOT EXPOSURE PROOF)
3) Exposure				
Waterproofness				
1) Spray				NOT APPLICABLE
2) Drip				NOT DRIP PROOF
Temperature and Pressure Tests				
1) Performance				NOT APPLICABLE
2) Endurance				
3) Derangement				
4) Low Pressure				
Special Tests				NONE

NOTE: Tests in category I are for type approval only; those in category II for type approval and quality maintenance; and those in category III are type approval, quality maintenance and production acceptance.

Where requirement is blank refer to G.D.S. 1000

CUSTOMER'S TECHNICAL APPROVAL

Authority (e.g. JOINT SERVICE, Admiralty, A.R.B., M.O.A., War Office, etc.)
 No. _____ Date _____
 No. _____ Date _____
 No. _____ Date _____

CUSTOMER'S IDENTIFICATION NUMBER

JOINT SERVICE CATALOGUE No. _____
 A.M. Ref. No. 59/25353 (WHEN SPECIFIED)

CONDITIONS OF USE

Voltage Range: _____ Frequency Range: _____
 Ambient Temperature Range: -20°C TO +40°C FUNCTIONING
 -65°C TO +70°C NO DERANGEMENT.
 Climatic Conditions: To Specification Q.T.P. 10858
 (i) Cycling } SEE DECLARATION
 (ii) Fungus }
 (iii) Exposure }
 Altitude: 60,000 ft (DES. 1 (1955) CHAPTER 105 REGION)
 Vibration: To Specification (CENTRAL CURVE A WITH TRANSMISSIBILITY FACTOR OF 10)
 Acceleration: To Specification A.P. 24 (1962) CHAPTER 103
 (i) During Operation 3g (ADDITIONAL ERROR AS QUOTED)
 (ii) For Subsequent Correct Operation 13g
 (iii) For Security of Mounting 25g
 Endurance: 30,000 HOURS (OPERATIONAL)
 Mounting Attitude: DIAL VERTICAL
 Mounting Method (A.V. or Rigid): VIBRATION MUST NOT EXCEED VALUE STATED ABOVE
 Radio Interference: NOT APPLICABLE
 Compass Interference: ± 15 INCHES FOR 1° DEFLECTION
 Fireproofness: NO FIRE RISK
 Dustproofness: NO REQUIREMENT
 Waterproofness: NOT WATERPROOF
 Special Limitations of use: 1250 HOURS (OPERATIONAL) BETWEEN CHECKS

CERTIFICATE OF DESIGN FORM 1000, ISSUE 1.

We Sangamo Weston Ltd., hereby declare and certify:-
 (i) that the aforementioned store is defined and accurately described by the foregoing abridged particulars and that it complies with the full requirements of this specification subject to the exceptions and/or qualifications listed below and the flight or other limitations set out in the Aircraft Equipment Installations Information (A.E.I.I.) or equivalent document.
 (ii) that all relevant design data, reports of specified tests, drawings and drawing lists have been completed and are a true record of the design and testing of the store to date.
 (iii) that if any statement on this certificate becomes inaccurate the certificate will be suitably amended and re-issued.

(Signed) _____
 (Signed) _____

for Sangamo Weston Limited.

Date: 20 DECEMBER 1962

NOTE: The issuing of this certificate does not of itself indicate either official acceptance of the store or authority to any contractor to depart from the requirements of any relevant S.D.M.

DESCRIPTION D.C. AMMETER 100-0-250 AMPS. FOR USE WITH 250A. 50mV SHUNT. LEAD RES. 0.5A

SPECIFICATION AND DECLARATION OF PERFORMANCE

Issue No.	1.	2.		
Date	24/12/62	25/12/62		

S231.3.58

SANGAMO WESTON LTD., ENFIELD, MIDDLESEX.

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