

An anemometer for run of wind or average wind speed measurements, when used together with an electronic counter or data logger. In operation, the 3-cup rotor turns a shaft and hence a magnetic actuator. The resultant varying field causes a mercury wetted reed-switch to make and break contact once per revolution of the rotor. The contacts are bounce free, simplifying connection to electronic circuits, and no power is required apart from that necessary to detect contact closure, thus facilitating use at remote sites. The rotor is tested by comparison with a standard calibrated by BMT (formerly NPL), and an individual calibration figure is provided.

Construction is from anodised aluminium alloys, stainless steels and weather resisting plastics for exposed parts, and the bearings (stainless steel shaft running in two precision corrosion resistant ball-races) are protected from entry of moisture droplets and dust, resulting in an instrument suitable for permanent exposure to the weather.

In the marine version (A100R/WR) a touching shaft-seal is fitted in place of the standard non-contact seal for extra protection, with a small increase in threshold speed. An anti-icing heater can be fitted if required.



ANEMOMETER WITH OPTIONAL 405 SERIES MAST-TOP ADAPTOR

Specification

Performance:	Threshold: 0.2m/s (0.6m/s A100R/WR) Max. speed: >75m/s. Accuracy: 1% of reading* (10-55m/s), 2% of reading (>55m/s). Distance constant: 2.3m.
Calibration:	0.8 revolutions per metre nominal (=1 contact closure per 1.25m).
Temperature range:	-30 to +70°C operation, -50 to +70°C storage, (H ₂ O solidifies at -38°C).
Size:	Height: 200mm, case dia. 55mm, screened cable: 3m standard length. Rotor dia. 150mm (standard 3-cup, type R30S).
Fixing:	Rotor: The unique Porton™ gravity sensitive fastener for rapid attachment and release. Anemometer: Standard tripod screw (0.25 inch UNC/BSW), taper adapter also available. Intended for upright operation only.
Electrical:	Switching voltage: Rated 72Vdc max., recommended operation: 1-5V. Switching current: Rated 40mA max., recommended operation: 1mA. Switch life: Rated 25 x 10 ⁹ operations min. (>20 years). Min. Current: Zero (life not reduced by use in dry circuits). Duty Cycle: 50% ±5% up to 50m/s (±10% up to 75m/s). Impedance: 120Ω series resistor plus 10nF capacitor across line for interference suppression.
Termination:	3 metres of 4-wire cable with overall screen: 7 x 0.2mm overall tinned copper wire braid screen and black pvc outer. Alternative standard lengths: 6m, 10m, 15m. (where extended, max. recommended overall length: 115m).
Connections:	Green: Terminal 1. Yellow: Terminal 2. (Red, Blue: Unused). Screen: Isolated.

*0.1m/s, 0.3 - 10m/s (0.7 - 10m/s for A100R/WR)



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Operating Instructions Contents:

General Operating Instructions (this document)	010-117-01	(OI-A100R-6)	(1 page)
Regular Maintenance (incl. cut-away view)	013-102-02	(M-A100R-2)	(2 pages)
Specification, Switching Anemometer	050-103-11	(S-A100R-11)	(1 page)
<u>Rotor Calibration Test Certificate</u> (packed with rotor)	010-108-02	(RCD-9)	(2 pages)



This instrument complies with the European CE Marking Directive (which includes ElectroMagnetic Compatibility - 'EMC') when used in accordance with these instructions provided that the recommended operating conditions are not exceeded. When used in this way, and when connected to other CE marked equipment intended to be used with this instrument, it should result in a system which also complies with the regulations (although this is not guaranteed). The instrument cable may be extended (using overall screened cable to DEF61-12 part 4 or similar with 7/0.2mm or 24AWG cores) up to 115m total length by use of junction box 2J-DS-A (2-way) or 3J-DL-A (3-way). Application circuits are available on request. OEM users and Value Added Resellers may need to make their own CE conformity declarations.

ANEMOMETER TYPE: A100R
(standard product, option /WR)
OPERATING INSTRUCTIONS

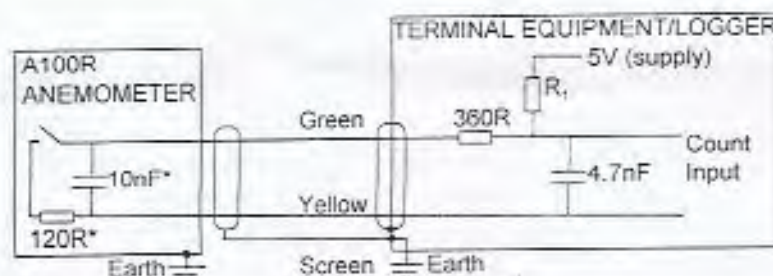


s/n: 5501
onwards

Health & Safety: Do not break open the hermetically sealed glass reed-switch/mercury capsule. Do not incinerate.

Anemometer Operating Instructions

- 1) Pull off the plastic protection cap, hold anemometer slightly out of vertical (spindle uppermost) and lightly push on the 3-cup rotor type R30S (R302S for A100R/WR) until positive location is obtained. To remove the rotor, first invert the instrument, press on the hub (approx. 1.5KgF) to release an internal gravity-sensitive catch, and allow to slide off.
AVOID USE OF EXCESSIVE FORCE.
This instrument contains a magnetic field switch partly filled with mercury. If subject to shock or vibration which may occur during transit, the mercury may become distributed in globules which sometimes affects normal operation. The mercury should therefore be driven down into its reservoir before using the instrument by shaking downwards whilst holding the instrument in an approximately vertical position.
- 2) Siting should be given careful consideration and our information sheet: 'General Notes on Siting Anemometers and Windvanes' 020-004 may be of assistance. Mount the anemometer using a 0.25 inch BSW or UNC screw into the base, ensuring that the screw projects between 0.22 and 0.3 inches into the instrument. Various mountings are available complete with captive screw. Mount vertically for accurate results. Note that the mercury reed-switch will not operate reliably at more than 15° from the vertical. The anemometer cable should not run close to conductors carrying heavy currents which may be frequently switched. For lightning protection see 'Lightning Protection Guidelines' 020-001. The instrument should be kept away from strong magnetic fields.
- 3) Connect the green and yellow output lines to the pulse counting equipment e.g. data-logger. Note that in many cases this equipment will include suitable filtering/noise immunity ('switch closure' / 'debounced input') and no additional components will be necessary. If this is not the case, a recommended input circuit is shown below. Note that the screen is isolated from the anemometer case which should normally be earthed via the mast. The screen of the cable should only be earthed at the terminal equipment end.



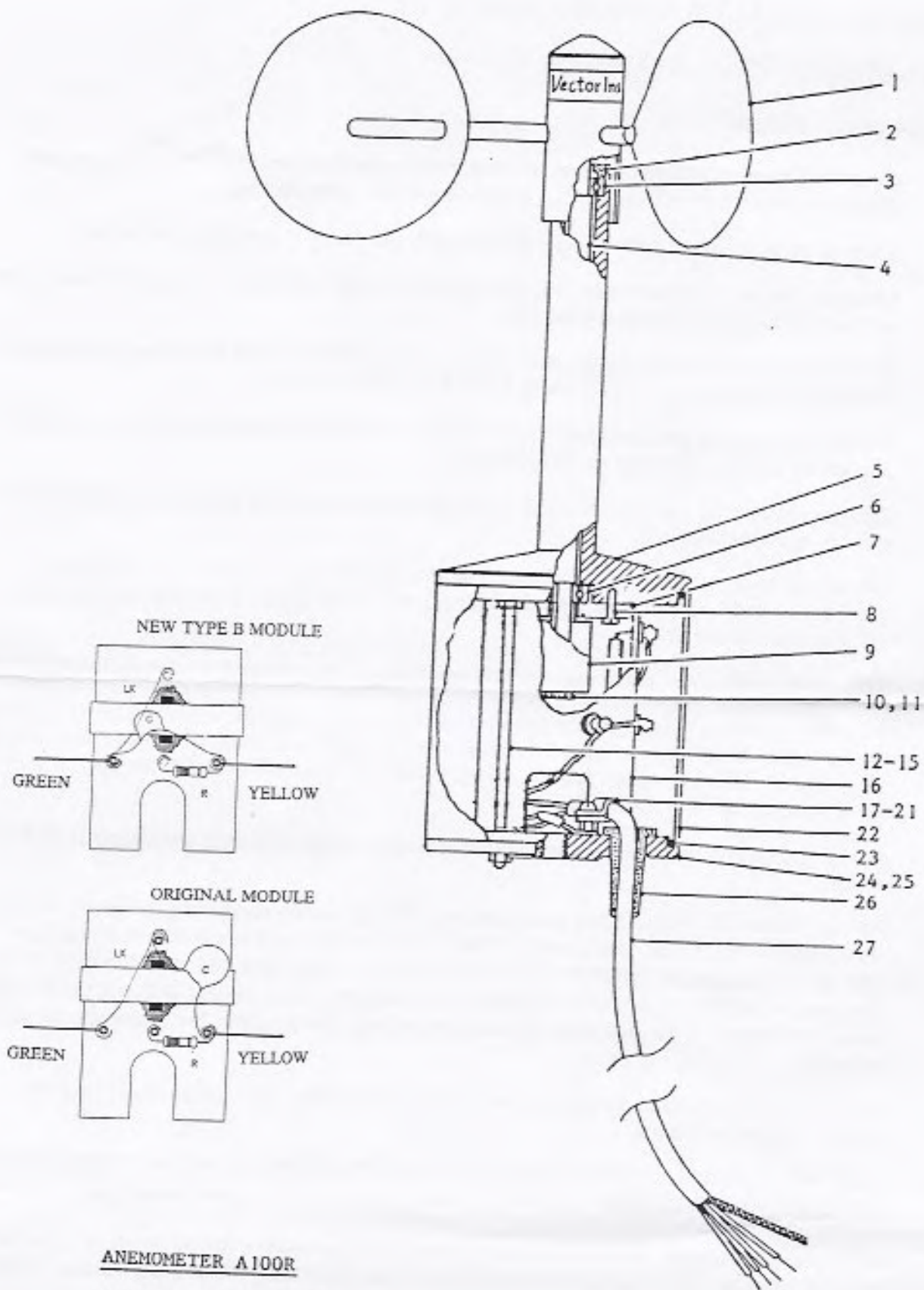
Cable Length (m)	Resistance R _t (KΩ)
0-25	9
26-50	8
51-115	6

*These components are built into the A100R

Anemometer Type: A100R, A100R/WR, A100R3REGULAR MAINTENANCE (2 - 3 years)Replacement of Bearings

1. Switch off power, disconnect cable, remove instrument from mounting, invert and remove rotor by pressing hub and releasing. Replace spindle protection cap.
2. Clean anemometer and rotor using a damp cloth and soapy water (do not immerse).
3. Unscrew nuts holding base plate (24) using a 5.5mm A/F (M3) nut-driver, pull off base plate with body-tube (22) and switch-tube (16).
4. Pull off the protection cap, grip spindle end (4) using hand-vice with soft jaws and unscrew magnetic rotor retaining nut (10) using a 5mm AF (6BA) spanner.
5. Remove nut, washer and magnetic rotor (9), unscrew bearing retainer screws (8), and pull out spindle with bearing retainer from below.
6. Remove old seal (2) using small screwdriver and push out old top bearing from below using spindle; clean all parts.
7. Place lower bearing* (6) onto spindle by inserting spindle end into packet of bearings (to avoid contamination), place bearing retainer (7) over bearing and assemble with top plate (5). Replace screws (8).
8. Slide on magnetic rotor, place washer (11) over special nut (10) and screw on loosely.
9. Slide on top bearing* (3), again by pushing spindle end into packet; press down using special jig, old (clean) bearing, or small screwdriver (do not apply excessive force, especially to inner ring). Ease in the new rubber seal (2). This is part no. S-1 standard non-touching, or part no. ST-1 touching for A100R/WR.
10. Re-tighten nut (10), lock this nut and screws (8) with a drop of locking compound such as shellac.
11. Replace bottom 'O' ring on base plate and top 'O' ring fully up against the flange on the top plate, push on body tube, insert switch tube (16) with attached wires positioned such that they will fall into the gap provided at the bottom of the switch tube. If the switch tube is to be changed, a matching magnetic rotor should be obtained. A simple test to check for 50% duty cycle is to connect to an analogue ohm meter and spin the spindle. The meter should read mid-scale.
12. Ensure 'O' ring is in place on base plate (rotate slightly when applying so that it rolls into place), replace base plate.
13. Apply non-drying silicone rubber compound around the studs (12), replace washers and nuts wiping off excess compound.

*The lower bearing is unshielded, the ball-cage being visible; the upper bearing can be identified by the shield which covers the ball-cage. Do not lubricate the new bearings as they are pre-lubricated during manufacture.



ANEMOMETER A100R

GENERAL ARRANGEMENT

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