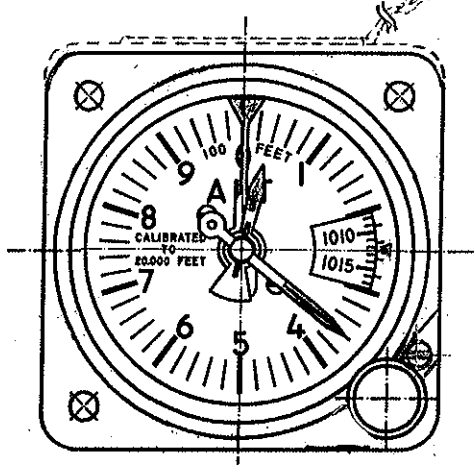
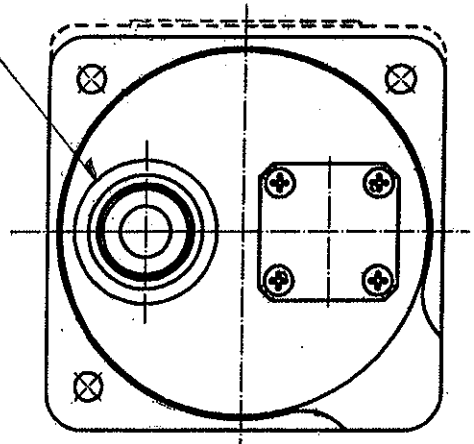


P/N 5237 SERIES

P/N 5237R SERIES  
RIGHT SIDE  
BARO KNOB OPTION



9/16-18 UNJF-3B



REAR VIEW FOR P/N 5237 SERIES  
ROTATED 90 DEG CW  
FOR P/N 5237R SERIES

- NOTE: 1. ALL 20,000 FT RANGE ALTIMETERS SHALL HAVE WHITE MARKING, 'CALIBRATED TO 20,000 FEET', AT 9 O'CLOCK POSITION ON DIAL. NOT APPLICABLE TO P/N 5237A SERIES: 35,000 FT.  
2. DOTTED LINES AND FIGURES IN PARENTHESIS ARE APPLICABLE TO LIGHTED UNITS ONLY.  
3. LIGHTED UNIT SHALL BE SUPPLIED WITHOUT LIGHT TRAY ASSEMBLY, UNLESS OTHERWISE SPECIFIED BY CUSTOMER. (SEE PAGE 2)

REV	DATE	CHK	REV	DATE	CHK	NAME	DATE
C	10/22/10						
A	4/29/10		B	6/15/10			
DELETED A-911, 913, 915, 917		CHNGD BARO STUD POS FOR 5237R & LIGHT TRAY OPT.		PREP. BY		APPR. BY	
ADDED LIGHTED UNITS AND CHNGD DIAL CONFIG.				CHECKER			
				NAME			



UNITED INSTRUMENTS, INC.  
3625 COMOTARA AVE.  
WICHITA, KS 67226

TITLE:  
INDICATOR - ALTIMETER  
2-INCH

SPEC. NO:  
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<u>UNITED INSTRUMENTS PART NO.</u>	<u>CODE NO.</u>	<u>BARO. KNOB LOCATION</u>	<u>RANGE (1,000 feet)</u>	<u>BAROMETRIC SCALE</u>	<u>BEZEL LIGHTING</u>
5237	A.901	Left	-1 to 20	in.Hg	No
5237	A.902	Left	-1 to 20	in.Hg	Yes
5237M	A.903	Left	-1 to 20	mb	No
5237M	A.904	Left	-1 to 20	mb	Yes
5237A	A.905	Left	-1 to 35	in.Hg	No
5237A	A.906	Left	-1 to 35	in.Hg	Yes
5237AM	A.907	Left	-1 to 35	mb	No
5237AM	A.908	Left	-1 to 35	mb	Yes
5237R	A.912	Right	-1 to 20	in.Hg	Yes
5237MR	A.914	Right	-1 to 20	mb	Yes
5237AR	A.916	Right	-1 to 35	in.Hg	Yes
5237AMR	A.918	Right	-1 to 35	mb	Yes

C

**LIGHTING BEZEL ASSEMBLY**

Baro Knob on Left Side: P/N BA2-001-003G-901L

Baro Knob on Right Side: P/N BA2-001-003G-901R

**LIGHT TRAY ASSEMBLY, with black and white lead wire per SAE AS22759/16-24 - OPTIONAL**

28-vdc LED: P/N BA28LED-24T

5-vdc LED: P/N BA5LED-24T

**UNITED INSTRUMENTS, INC.  
3625 COMOTARA AVENUE  
WICHITA, KANSAS 67226**

**TITLE:**

**INDICATOR – ALTIMETER  
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**UI5237**

**ISSUE**

**C**

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1. GENERAL

- 1.1. Purpose: This specification defines standards of minimum performance and conditions under which these standards apply for the Model 5237 Altimeter supplied by United Instruments, Incorporated.
- 1.2. Description: The Model 5237 Sensitive Altimeter is for use on aircraft to indicate the height of the aircraft above a reference point, generally mean sea level, assuming standard conditions of temperature and pressure. The altimeter measures the existing barometric pressure. Since atmospheric pressure varies with altitude, this pressure is indicated on the dial in feet of altitude. The altimeter may be manually adjusted to variances in barometric pressure.  
  
The sensing element (diaphragm assembly) and gear train are encased in metal case with a fitting boss. The altitude is indicated in a three pointer display. An increase in altitude results in a clockwise rotation of the pointers.
- 1.3. Operating Limits: The part number 5237 series Altimeter operates through a maximum calibrated range of -1,000 to 20,000 feet. The part number 5237A series Altimeter operates through a maximum calibrated range of -1,000 to 35,000 feet.
- 1.4. Barometric Scale Adjustment: The barometric scale setting is adjustable by means of an adjustment knob located in the lower left, or right, hand corner of the altimeter. Due to the variances in the barometric pressure it is necessary to set the barometric scale to the existing barometric pressure. The existing barometric pressure may be obtained from the weather station or control tower. Rotation of the knob for barometric scale adjustment results in rotation of the pointers on the altitude dial. An increase in barometric scale will result in an increase in the altitude as indicated on the dial. This relationship of pointers to barometric scale is based on standard conditions of pressure and temperature. Mechanical stops are provided to prevent incorrect readings of the pressure scale when the limits of the barometric scale are exceeded.
- 1.5. Weight: The weight of the instrument shall be  $0.9 \pm 0.1$  LBS.
- 1.6. Cover Glass: The cover glass shall be coated with HEA.

2. ENVIRONMENTAL CONDITIONS:

When installed in accordance with United Instruments, Incorporated, instructions, the altimeter will function in the following environmental ranges.

- 2.1. Temperature: -30°C to 50°C, -65° to +70° for storage
- 2.2. Vibration:
 

<u>C.P.S.</u>	<u>MAX. DOUBLE APLITUDE</u>	<u>MAX. ACCELERATION</u>
5 to 50	0.020 inch	1.5 g
50 to 500		0.5 g
- 2.3. Humidity: 0% to 95% at 32°C
- 2.4. Altitude:
  - 1,000 feet to 20,000 feet – Part Number 5237 series
  - 1,000 feet to 35,000 feet – Part Number 5237A series
- 2.5. Magnetic Effect: No effect to the operation of other instruments installed.

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3. STANDARD TEST CONDITIONS:

- 3.1. Atmospheric Conditions: Unless otherwise specified all tests required by this specification shall be conducted at an atmospheric pressure of approximately 29.92 inches of mercury, or 1,013.25 mb, and at an ambient temperature of approximately 25°C and at a relative humidity of not greater than 85 percent.
- 3.2. Vibration (To minimize friction): Unless otherwise specified, all test for performance may be conducted with the instrument subjected to a vibration of 0.002 to 0.005 inch double amplitude at a frequency of 1,500 to 2,000 cycles per minute.
- 3.3. Position: Unless otherwise specified all test shall be made with the altimeter mounted in its normal operating position.

4. INDIVIDUAL PERFORMANCE REQUIREMENTS:

- 4.1. Scale Error: With the barometric scale pressure at 29.92 inches of mercury, the altimeter shall be subjected successively to pressures corresponding to the altimeter specified in Table I up to the maximum calibrated range of the altimeter being tested. The reduction in pressure shall be made at a rate not in excess of 20,000 feet per minute to within approximately 2,000 feet of the test point. The test point shall be approached at a rate compatible with the test equipment. The altimeter shall be kept at the pressure corresponding to each test point for at least on minute, but not more than 10 minutes, before reading is taken. The error at all test points must not exceed the tolerances specified in Table I. Following a minimum delay of 4 hours this test may be repeated and the altimeter shall meet tolerances as specified in Table I.
- 4.2. Hysteresis: The hysteresis test shall begin not more than 15 minutes after the altimeter's initial exposure to the pressure corresponding to the upper limit of the scale error test prescribed in paragraph 4.1; and while the altimeter is at this pressure, the hysteresis test shall commence. Pressure shall be increased at a rate simulating a descent in altitude at the rate of 5,000 to 20,000 feet per minute until within 3,000 feet of the first test point 50 percent of the maximum altitude. The test point shall be approached at a rate of approximately 3,000 feet per minute. Within 10 seconds after the pressure has been stabilized at the test point, the instrument indication shall be within 100 ft of the scale error reading. The altimeter shall be kept at this pressure for at least 5 minutes, but not more than 15 minutes, before the reading is taken. After the reading has been taken, the pressure shall be increased further, in the same manner as before, until the pressure corresponding to the second test point 40 percent of the maximum altitude is reached. The altimeter shall be kept at this pressure for at least 1 minute, but not more than 10 minutes, before the test reading is taken. After the reading has been taken, the pressure shall be increased further, in the same manner as before, until atmospheric pressure is reached. The reading of the altimeter at either of the two test points shall not differ by more than 75 feet from the reading of the altimeter for the corresponding altitude recorded during the scale error test prescribed in paragraphs 4.1.
- 4.3. After Effect: Not more than five minutes after the completion of the hysteresis test prescribed in paragraph 4.2, the reading of the altimeter (corrected for any change in atmospheric pressure) shall not differ from the original reading by more than 30 feet.
- 4.4. Friction: The altimeter shall be subjected to a steady rate of decrease of pressure of approximately 750 feet per minute. At each altitude listed in Table II, the altimeter reading will be noted before and after vibration, the difference will not exceed tolerance shown.

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- 4.5. Case leak: The leakage of the altimeter, when the pressure within it corresponds to an altitude of 18,000 feet, shall not change the altimeter reading by more than 100 feet during an interval of 1 minute.
- 4.6. Position Error: With atmospheric pressure applied to the instrument, the difference between pointer indication when the instrument is in normal operating position and when it is in any other position shall not exceed 20 feet.
- 4.7. Barometric Scale Error: At constant atmospheric pressure, the barometric pressure scale shall be set at each of the pressures (falling within its range of adjustment) that are listed in Table III and shall cause the pointer to indicate the equivalent altitude difference shown in Table III with a tolerance of 25 feet.

5. INSTALLATION INSTRUCTIONS:

- 5.1 Aircraft Static System: Must meet the requirements of Federal Aviation Regulations Volume 5, Part 43, Appendix E.
- 5.2 Connection: The altimeter to the static system connection must include a flexible hose or tubing to provide vibration isolation.
- 5.3 Fitting: The threads of the fitting inserted should be coated to prevent seizing or leakage.

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FUNCTIONAL TEST DATA

TABLE I

SCALE ERROR

<u>ALTITUDE (Feet)</u>	<u>EQUIVALENT PRESSURE (Inches of Mercury)</u>	<u>TOLERANCE (±Feet)</u>
-1,000	31.018	20
0	29.921	20
500	29.385	20
1,000	28.856	20
1,500	28.335	25
2,000	27.821	30
3,000	26.817	30
4,000	25.842	35
6,000	23.978	40
8,000	22.225	60
10,000	20.577	80
12,000	19.029	90
14,000	17.577	100
16,000	16.216	110
18,000	14.942	120
* 20,000	13.750	130
22,000	12.636	140
25,000	11.104	155
30,000	8.885	180
** 35,000	7.041	205

\*: Maximum test point for P/N 5237series

\*\* : Maximum test point for P/N 5237A series

TABLE II

FRICTION

<u>ALTITUDE (Feet)</u>	<u>TOLERANCE (± Feet)</u>
1,000	70
2,000	70
3,000	70
5,000	70
10,000	80
15,000	90
* 20,000	100
25,000	120
30,000	140
** 35,000	160

\*: Maximum test point for P/N 5237 series

\*\* : Maximum test point for P/N 5237A series

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TABLE III

PRESSURE - ALTITUDE DIFFERENCE

INCHES OF MERCURY SCALE		MILLIBAR SCALE	
PRESSURE (IN HG)	ALTITUDE DIFFERENCE (Feet)	PRESSURE (Millibars)	ALTITUDE DIFFERENCE (Feet)
28.10	- 1727	950	- 1766
28.50	- 1340	965	- 1337
29.00	- 863	980	- 913
29.50	- 392	995	- 495
29.92	0	1013	0
30.50	+ 531	1030	+ 461
30.90	+ 893	1045	+ 863
30.99	+ 974	1050	+ 996

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