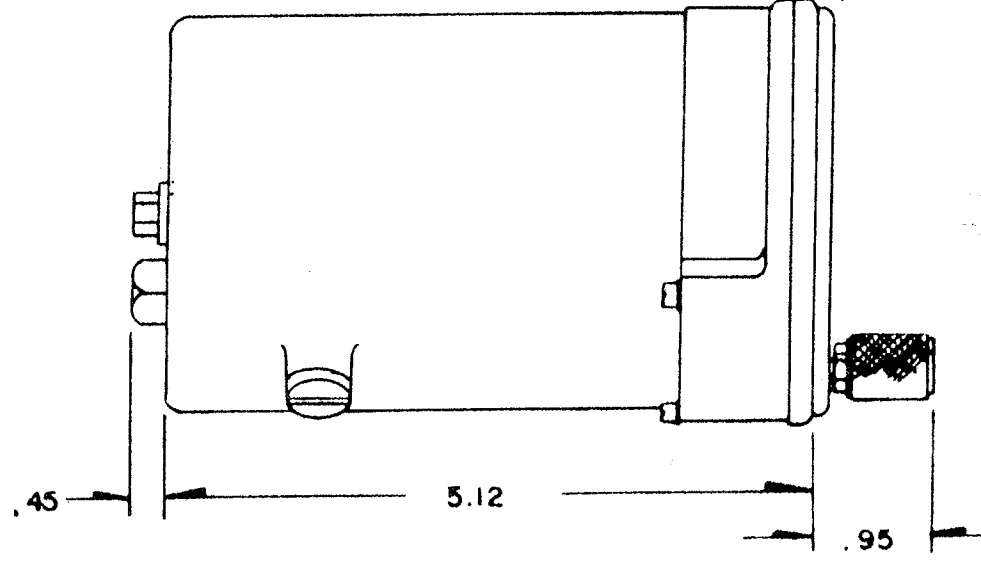


TRANSITION MARKS
ONLY FOR ORANGE
ENCODING COLOR


J1	
1	D4
2	A1
3	A2
4	A4
5	B1
6	SIG COMM
7	OPEN
8	+27.5 VDC
9	B2
10	B4
11	C1
12	C4
13	C2
14	+13.75 VDC
15	GROUND

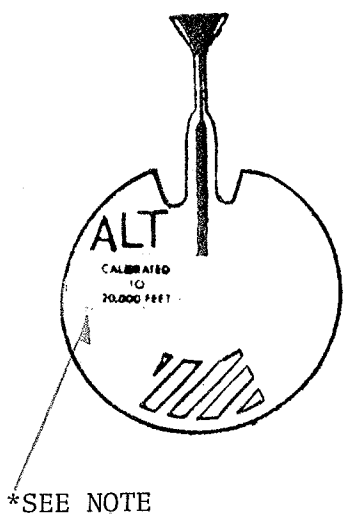
INTERCONNECT
WIRING



WEIGHT 1.9 LBS.

REV. DATE	CHK.	REV. DATE	CHK.	DESCRIPTION	PREP. BY	DATE
	C	3/27/06		Updated HYS Reg 12 (para. 3:2) & corrected P. A.I. Diff (p. 6:10-11)	ZK	2-27-79
	B	7-22-85		CORRECTED BEZEL THICKNESS (PG. 1)	ZK	5-1-79
D 3/6/09	A	10-21-77		ADDED P. 39 & P. 50	ZK	

 <p>UNITED INSTRUMENTS, INC. 3625 Comotara Avenue Wichita, Kansas 67226</p>	<p>TITLE: ALTIMETER-ENCODER, DUAL BAROMETRIC SCALE</p>	<p>SPEC. NO: UI5035P-P41</p>	<p>ISSUE D</p>
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*NOTE: CALIBRATED TO 20,000 FEET shall appear in white on 20,000 foot dial.

<u>UI PART NO.</u>	<u>CODE NO.</u>	<u>RANGE</u>	<u>ENCODING COLOR</u>
5035P-P41	P.41	35,000 ft.	ORANGE
5035P2-P42	P.42	20,000 ft.	ORANGE
5035P2-P39	P.39	20,000 ft.	WHITE
5035P-P50	P.50	35,000 ft.	WHITE

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1.0 GENERAL

1.1 Purpose:

This specification defines standards of minimum performance and conditions under which these standards apply for the Model 5035 Altimeter - Encoder.

1.2 Description:

The Model 5035 Altimeter - Encoder 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 variance in barometric pressure.

The internal encoder provides altitude signals in accordance with ICAO altitude code requirements. The code output is unaffected by the knob rotations associated with usual altimeter operation.

The sensing element (diaphragm assembly) and gear train are encased in a die cast aluminum case. The altitude is indicated in a three pointer display. An increase in altitude results in a clockwise rotation of the pointers. The gear train driving the pointer also drives the encoder thus permitting accurate correlation. Electrical power failure or circuit component failure cannot impair the ability of the altimeter to function normally.

1.3 Operating Limits:

The Model 5035 Altimeter operates through a maximum calibrated range of -1,000 to 35,000 feet. Encoder output resolution is 100 feet. Input voltage variation should not exceed plus or minus 15 percent. The signal output to common closed circuit voltage drop will not exceed 0.7 VDC at 0.005 AMP.

1.4 Barometric Scale Adjustment:

The barometric scale setting is adjustable by means of an adjustment knob located in the lower left 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. The 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.

2.0 STANDARD TEST CONDITIONS:

2.1 Atmospheric Conditions:

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Unless otherwise specified, all tests required by this specification shall be conducted at an atmospheric pressure of approximately 29.92 inches of mercury and at the ambient temperature of approximately 25°C and at a relative humidity of not greater than 85 percent.

2.2. Vibration to minimize friction:

Unless otherwise specified, all tests 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.

2.3 Position:

Unless otherwise specified, all tests shall be made with the altimeter mounted in its normal operating position.

3.0 INDIVIDUAL PERFORMANCE REQUIREMENTS:

3.1 Scale Error:

With the barometric pressure scale at 29.92 inches of mercury, the altimeter shall be subjected successively to pressure corresponding to the altitude 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 one minute, but not more than ten 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 four hours this test may be repeated and the altimeter shall meet tolerances as specified in Table I.

3.2. 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 3.1. 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 maximum altitude). The test point shall then 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 100ft. of the scale error reading obtained in Scale Error test. 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 maximum altitude) is reached. The altimeter shall be kept at this pressure for at least one 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 3.1.

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3.3 After Effect:

Not more than five minutes after the completion of the hysteresis test prescribed in 3.2, the reading of the altimeter (corrected for any change in atmospheric pressure) shall not differ from the original reading by more than thirty (30) feet.

3.4 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 the tolerance shown.

3.5 Case Leak:

The leakage of the altimeter case, when the pressure within it corresponds to an altitude of 18,000 feet, shall not change the altimeter reading by more than 100 feet per minute.

3.6 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 twenty (20) feet.

3.7 Barometric Scale Error:

At constant atmospheric pressure, the barometric pressure scale shall be set at each of the pressure (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 twenty-five (25) feet.

3.8 Pointer Oscillation:

There shall be no more than 20 feet of pointer oscillation when the instrument is subjected to vibration mounted in normal operating position at frequencies to be varied uniformly from 5 to 50 cycles per second at a maximum double amplitude of .020 inches and maximum acceleration of 1.5 g's; and 50 to 500 cycles per second at a maximum acceleration of 0.5 g's.

3.9 Encoder Signal Error Test:

3.9.1 With the barometric scale set exactly on 29.92 inches of mercury (1013.25 millibars) and vibration applied to remove friction (para. 2.2) connect the Altimeter - Encoder to a suitable encoder-transponder tester. Connect the static pressure port to a controlled pressure source.

3.9.2 The altitude code error is determined by noting the altitude indication of the altimeter-encoder pointers at the instant of the code transition to the next consecutive altitude code. To obtain accurate reading of the pointers at the instant of transition,

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the rate of change of the pointers when approaching the transition point must not exceed 1,000 feet per minute and not less than 500 feet per minute.

3.9.3 Apply pressure to successively test the altitude code transition at the points shown in Table IV.

CAUTION

The barometric scale must be set exactly on 29.92 inches of mercury (1013.25 mb) to synchronize the pointers with the altitude code output.

4.0 ENVIRONMENTAL CONDITIONS:

When installed in accordance with United Instruments, Inc. instructions the Altimeter - Encoder will function in the following environmental ranges.

4.1 Temperature: -30°C to 50°C

4.2 Altitude: -1,000 to 35,000 feet.

4.3 Humidity: 0% to 95% at 32°C.

4.4 <u>Vibration:</u>	<u>Frequency</u>	<u>Max. Double Ampl.</u>	<u>Max. Accel.</u>
	5 to 50 Hz.	.020 inch	1.5 g's
	50 to 500 Hz.	-----	0.5 g's

5.0 INSTALLATION INSTRUCTIONS:

The aircraft static system must meet the requirements of FAR Part 43 App. E. The altimeter connection to the static system must include a flexible hose or tubing to provide vibration isolation.

5.1 Fitting:
The threads of the 1/8-27 ANPT fitting to be inserted should be coated to prevent seizing or leaking.

5.2 Electrical Connector:
The Cannon connector (DAH-15P-201) mates with Cannon socket DA-15S or equivalent.

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TABLE I
(Scale Error)

<u>ALTITUDE</u> <u>(feet)</u>	<u>EQUIVALENT PRESSURE</u> <u>(inches of mercury)</u>	<u>TOLERANCE</u> <u>± (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

TABLE II
(Friction)

<u>ALTITUDE</u> <u>(feet)</u>	<u>TOLERANCE</u> <u>± (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

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TABLE III
(Pressure - Altitude Difference)

<u>PRESSURE</u> (inches of mercury)	<u>ALTITUDE</u> <u>DIFFERENCE</u> (feet)	<u>PRESSURE</u> (millibars)	<u>ALTITUDE</u> <u>DIFFERENCE</u> (feet)
28.10	-1727	950	-1766
28.50	-1340	965	-1337
29.00	- 863	980	- 913
29.50	- 392	995	- 495
29.92	0	1013,00	0
30.50	+ 531	1030	+ 461
30.90	+ 893	1045	+ 863
30.99	+ 974	1050	+ 996

TABLE IV
ALTITUDE CODE OUTPUT ERROR

<u>ALTITUDE</u> Code Output (in feet)	<u>ALTITUDE INDICATION</u>					
	<u>Increasing Altitude</u> (in feet)		<u>Decreasing Altitude</u> (in feet)			
0	-50	+50	50	+50		
1,000	950		1,050			
2,000	1,950		2,050			
3,000	2,950		3,050			
4,000	3,950		4,050			
6,000	5,950		6,050			
8,000	7,950		8,050			
10,000	9,950		10,050			
16,000	15,950		16,050			
20,000	19,950		20,050			
25,000	24,950		25,050			
30,000	29,950		30,050			
35,000	34,950		+50		35,050	+50

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