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KI 300 ELECTRONIC ATTITUDE INDICATOR INSTALLATION MANUAL

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RECORD OF REVISIONS

Revision	Revision Date	Description
0	10/26/2017	Initial release
1	6/10/2018	KA310-207 – Update to capture changes in the KI 300 setup pages

CURRENT REVISION DESCRIPTION

Section	Description
N/A	Initial release
4.7.3	KA310-205 – Updates from Sandia Aerospace. • SAISW-44 - Add Diagnostic Mode (Setup menu) • SAISW-55 - Add Yaw Rate Alignment to setup pages • SAISW-73 – Setup Page for Panel Type

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1 INTRODUCTION

1.1 How to Use This Manual

1.1.1 General

(1) This publication gives installation and maintenance instructions for the equipment shown on the Title page.

(2) Standard maintenance procedures that technicians must know are not given in this manual.

(3) Warnings, cautions, and notes in this manual give the data that follows:

A WARNING gives a condition or tells personnel what part of an operation or maintenance procedure, which if not obeyed, can cause injury or death.

A CAUTION gives a condition or tells personnel what part of an operation or maintenance procedure, which if not obeyed, can cause damage to the equipment.

A NOTE gives data, not commands. The NOTE helps personnel when they do the related instruction.

(4) Warnings and cautions go before the applicable paragraph or step. Notes follow the applicable paragraph or step.

1.1.2 Observance of Manual Instructions

(1) Make sure that you carefully obey all safety, quality, operation, and shop procedures for the unit.

(2) All personnel who operate equipment and do maintenance specified in this manual must know and obey the safety precautions.

1.1.3 Symbols

(1) The symbols and special characters are in agreement with IEEE Publication 260 and IEC Publication 27. Special characters in text are spelled out.

(2) The signal mnemonics, unit control designators, and test designators are shown in capital letters.

(3) The signal names followed by an “*” show an active low signal.

(4) The symbols in Figure 1-1 show ESDS and moisture sensitive devices.

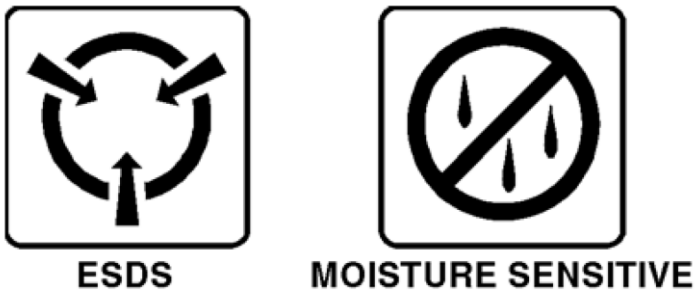


Figure 1-1 Symbols

1.1.4 Units of Measure

Measurements, weights, temperatures, dimensions, and other values are expressed in the USMS followed by the appropriate SI metric units in parentheses. Some standard tools or parts such as drills, taps, bolts, nuts, etc. do not have an equivalent.

1.1.5 Electrostatic Discharge

Touch the items susceptible to electrostatic discharge in accordance with MIL-HDBK-263. Refer to MIL-STD-1686 for definition of the standards and conditions.

1.2 References

1.2.1 Other Publications

These publications are standard references. Check for latest version of publication.

Document Number	Description
	The United States GPO Style Manual (available at http://www.gpo.gov/fdsys/pkg/GPOSTYLEMANUAL-2008/content-detail.html)
IEEE Std 260.1	Standard Letter Symbols for Units of Measurement (available from the American National Standards Institute at http://www.ansi.org)
ASME Y14.38	Abbreviations for Use on Drawings and Related Documents (available from the American National Standards Institute at http://www.ansi.org)
ASME Y14.5	Dimensioning and Tolerancing (available from the American National Standards Institute at http://www.ansi.org)
ANSI/IEEE Std 91	Graphic Symbols for Logic Functions (available from the American National Standards Institute at http://www.ansi.org)
	H4/H8 CAGE Codes (available from DLA Logistics Information Services at http://www.logisticsinformationservice.dla.mil)
IEEE 315/ANSI Y32.2	Graphic Symbols for Electrical and Electronics Diagrams (available from the American National Standards Institute at http://www.ansi.org)
MIL-HDBK-263	Electrostatic Discharge Control Handbook for Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices) (Metric) (available from any military standards database)

Document Number	Description
MIL-STD-1686	Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices) (Metric) (available from any military standards database).

1.3 Acronyms and Abbreviations

(1) The abbreviations are used in agreement with ASME Y14.38.

(2) Acronyms and non-standard abbreviations used in this publication are as follows in Table 1-1.

Table 1-1 Acronyms and Abbreviations

Acronyms and Abbreviations	Definition
AC	Advisory Circular
AHRS	Attitude and Heading Reference System
AMP	Ampere
ANSI	American National Standards Institute
AP	Autopilot
ARS	Attitude Reference System
ARINC	Aeronautical Radio, Incorporated
AS	Aerospace Standard
ASME	American Society of Mechanical Engineers
AWG	American Wire Gauge
BNR	Binary Number
C	Celsius
CAGE	Commercial and Government Entity
CBIT	Continuous Built-in Test
CFR	Code of Federal Regulations
CG	Center of Gravity
CMT	Configuration and Maintenance Tool
CPU	Central Processing Unit
DAL	Design Assurance Level
DC	Direct Current
ECCN	Export Control Classification Number
ESD	Electrostatic Discharge
ESDS	Electrostatic Discharge Sensitive
F	Fahrenheit
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FCS	Flight Control System
FD	Flight Director
GPO	Government Printing Office
I/O	Input/Output
ICA	Instructions for Continued Airworthiness

Acronyms and Abbreviations	Definition
ID	Identification
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IM	Installation Manual
IMM	Installation and Maintenance Manual
inHg	Inch of mercury
in-lb	inch-pound
kbps	kilobytes per second
kg	Kilogram
kPa	kilopascal
lb	Pound
m	Meter
mb	millibars
Min	minute
mm	Millimeter
Mph	Miles per hour
NA	Not Applicable
NiMh	Nickel-Metal Hydride
No.	Number
Nm	Newton Meter
NVM	Non-Volatile Memory
PBA	Printed Board Assembly
PBIT	Power-up Built-in Test
PC	Personal Computer
PN	Part Number
Pub.	Publication
RAM	Random Access Memory
RF	Radio Frequency
RTCA	Radio Technical Commission for Aeronautics
SAE	Society of Automotive Engineers
SDI	Serial Digital Interface
SI	International System of Units
SN	Serial Number
STC	Supplemental Type Certificate
SW	Software
TR	Temporary Revision
TSO	Technical Standard Order
U.S.A.	United States of America
USB	Universal Serial Bus
USMS	United States Measurement System
V	Volt
VDC	Volts Direct Current
VFR	Visual Flight Rule

2 GENERAL INFORMATION

2.1 Introduction

This manual describes the installation of the BendixKing KI 300 Electronic Attitude Indicator. It is intended for use by FAA certified repair stations to install the KI 300 indicator and includes both mechanical and electrical installation information.

System configuration, and continued airworthiness are included. The installer must ensure that all functions are operating properly according to their intended purpose in their particular installation.

Visit the BendixKing web site (www.bendixking.com) for current updates and supplemental information concerning the operation of this and other BendixKing products.

2.2 KI 300 Overview

The KI 300 Electronic Attitude Indicator is a panel mounted attitude, airspeed, altitude, vertical speed and slip. The instrument is self-contained and directly incorporates all of the sensors required to measure and display the listed flight parameters.

All information is displayed on a color 3.5” diagonal LCD display in traditional aerospace symbology. The unit also contains a rechargeable battery capable of providing continued operation in the event of aircraft electrical failure.

2.2.1 System Functions

The KI 300 performs the following functions:

- Display of Indicated Airspeed (Knots or Mph)
- Display of Barometric Altitude (Feet)
- Display of Roll & Pitch (Fixed Pointer Format, Degrees)
- Display of Slip Indication (Degrees)
- Display of Vertical Speed Indication (feet per minute)
- Pilot Entered Baro Correction (mb or inHg – Configurable Default Value)
- Automatic and Manual Backlight Control (%)
- Display of Battery Charge Status (% Remaining)
- Display of V-Speed Limitations (Colored Bands)
- Altitude Bug (Pilot Adjustable) (For reference only, not and altitude pre-select function)
- Display of Flight Director Command Bars (When interfaced with the KA 310)
- Display of Decision Height Alert (When interfaced with the KA 310)

Various parameters can be configured by the installer (not pilot accessible):

- Configuration of Roll & Tilt Offsets
- Configuration of Airspeed and Altitude Trim
- Configuration of Airspeed Units
- Configuration of V-Speeds
- Configuration of Baro Units
- Configuration of Baro Default Value
- Configuration of Battery Type
- Enable/Disable Airspeed Tape
- Enable/Disable Altitude Tape
- IVSI Enable/Disable and Filter Lag
- Slip/Skid indicator (Ball, polygon, both)
- Configuration of Autopilot Interface (None, Analog, Analog w/FD, Digital)
- Legacy autopilot alignment interface
- Air data calibration interface
- Diagnostic Mode
- Yaw Rate Alignment
- Panel Type (Hard, Float)

Non TSO'd functions have been verified to not interfere with TSO'd functions.

2.2.2 System Interfaces

Airspeed and altitude are derived from internal pressure sensors that are connected to the aircraft's pitot and static lines. Airspeed is determined by the pressure difference between the pitot and static ports, while altitude is determined by the pressure on the static port. Altitude is barometrically corrected by the pilot entered baro value prior to being displayed.

Aircraft power is the only electrical interface present for the KI 300. Communication to the KA 310 Autopilot Adapter is the only data interface provided from the KI 300. No data interface is provided to other avionic systems in the aircraft.

2.3 KA 310 Overview

The KA 310 Autopilot Adapter is an optional remote mounted analog and digital unit. The unit receives attitude data from the KI 300 and converts the serial data into analog or digital outputs to support an interface to BendixKing legacy autopilots. Refer to the KA 310 AML STC Installation Manual PN 89000004-200 for detailed installation information on the KA 310.

2.4 Regulatory Compliance

This article meets the minimum performance and quality control standards required by the TSO listed in the tables below.

Table 2-1 KI 300 TSO Authorization

Function	TSO/SAE/RTCA	Category
Airspeed	TSO-C2d	Type B
Turn and Slip	TSO-C3e	-
Bank and Pitch	TSO-C4c	-
Altimeter	TSO-C10b	Type II
Display	TSO-C113a	-
AHRS	TSO-C201	A5HXT7
Vertical Speed Indicator	TSO-C8E	Type B
Battery	RTCA DO-347	“Small” Lipo – 4.81Wh

2.5 Technical Specifications

Table 2-2 KI 300 Technical Specifications

Characteristic	Specification
Unit Dimensions	2.25 inches x 3.52 inches x 3.22 inches (L x W x H) (57 mm x 89 mm x 82 mm)
Bezel Dimensions	0.51 inches x 3.52 inches x 3.22 inches (L x W x H) (13 mm x 89 mm x 82 mm)
Operating Temperature	-20 °C to +55 °C
Mounting	Standard 3” Round Hole
Weight	0.8 lbs (Including Battery & Bracket)
Pneumatic Fittings	1/16 NPTF (1/8” Barbed Adapters Supplied)
Viewing Angle	60° Left/Right, 45° Up/Down
Current Draw	2 Amp Max
Operating Voltage	10.0 to 32.0 VDC
Circuit Breaker	2.0 AMP
Software	RTCA/DO-178C Level C
Hardware	NA
Connectors	DB-9
Environmental	RTCA DO-160G (See Qual Table)
Airspeed Limits	Vso, Vs1, Vfe, Vno, Vne, Vyse, Vmc
MTBF	>10,000 hours

Table 2-3 KI 300 Performance Characteristics

Characteristic	Specification
Time to Initialize	< 3 Minutes Typical
Airspeed Range	30 to 400 Knots (30 to 460 Mph)
Altitude Range	-1500 to 35,000 Feet
Vertical Speed Range	-5,000 to 5,000 Feet/Min
Baro-Correction Range	28.00 to 31.00 inHg 948 to 1050 mb
Roll/Pitch Accuracy	1° Static Conditions
Roll/Pitch Range	Unlimited
Slip Range	±7° Displayable
Slip Accuracy	1° Static Conditions
Max Roll Rate	400° / Second
Max Sustained G	6g
Roll/Pitch/Slip Resolution	Sub-pixel (340 x 240)
Battery Type 0 (P/N 89500004-TBD)	Li-Poly, 7.4V, 1300mAh, Heated
Battery Life -20°C, 100% Brightness +23°C, 100% Brightness +55°C, 100% Brightness	 0.5 Hours Minimum 2.0 Hours Minimum 3.0 Hours Minimum
Battery Charge Time	4 Hour Typical (From Fully Discharged)
Battery Heat Time	15 Minutes Max @ -20°C Cold Soaked

2.6 Environmental Qualification form (EQF)

Table 2-4: KI 300 Environmental Qualification Form (EQF)

DO-160G Section	Condition	Category	Notes
4.0	Temperature Ground Survival Low Short Term Low Operating Low Ground Survival High Short Term High Operating High In-Flight Loss of Cooling Altitude Altitude Decompression Overpressure	A1/C1	 -55°C -40°C -20°C +85°C +70°C +55°C Not Applicable 35,000 Feet 8,000 to 35,000 Feet -15,000 Feet
5.0	Temperature Variation	C	2°C/minute
6.0	Humidity	A	
7.0	Operational Shocks and Crash Safety	B	AC Type 5, Random
8.0	Vibration	S(curve M)	Zone 2, fixed wing
9.0	Explosive Atmosphere	X	
10.0	Waterproofness	X	
11.0	Fluids Susceptibility	X	
12.0	Sand and Dust	X	
13.0	Fungus Resistance	X	
14.0	Salt Fog	X	
15.0	Magnetic Effect	Z	
16.0	Power Input	BXX	
17.0	Voltage Spike	A	
18.0	Audio Frequency Conducted Susceptibility	B	
19.0	Induced Signal Susceptibility	ZCX (Note 1)	
20.0	Radio Frequency Susceptibility (Radiated and Conducted)	WF	
21.0	Emission or Radio Frequency Energy	M	
22.0	Lightning Induced Transient Susceptibility	B3K3	
23.0	Lightning Direct Effects	X	
24.0	Icing	X	
25.0	Electrostatic Discharge (ESD)	A	
26.0	Fire, Flammability	X	

Note1: Section 19 tested as a system with the KA 310.

2.7 Repair and Return

Refer to the troubleshooting instructions in Section 6 - Troubleshooting. If repair is necessary, the unit must be sent to a BendixKing repair facility. There are no field repairable items inside the KI 300.

For information on returning the unit, contact BendixKing support.

Telephone: (855) 250-7027 (Toll Free U.S.A./Canada)

Telephone: (505) 903-6148 (International Direct)

Website: http://www.bendixking.com/support

E-mail: techsupport@bendixking.com

3 INSTALLATION CONSIDERATIONS

3.1 Introduction

The KI 300 provides stand-alone, basic airspeed, altitude, attitude and slip functions. The KI 300 will only support integration with the KA 310 Autopilot Adapter and does not support integration with any other avionics systems, nor does it provide complex switching interfaces with other equipment or systems. Installation is limited to power, ground, pitot and static connections and data communication with the KA 310 (Refer to the KA 310 AML STC Installation Manual PN 89000004-200 for installation information to interface the KI 300 with the KA 310).

3.2 Certification Considerations

The KI 300 should be installed per *FAA Policy Statement PS-ACE-23-08-R1 Replacement of Vacuum Driven Attitude Indicators in 14 CFR part 23/CAR 3 Airplanes*

3.2.1 Installation Approval

The conditions and tests for TSO approval of this article are minimum performance standards. Those installing this article, on or in a specific type or class of aircraft, must determine that the aircraft installation conditions are within the TSO standards. TSO articles must have separate approval for installation in an aircraft. The article may be installed only according to 14 CFR Part 43 or the applicable airworthiness requirements.

This article meets the minimum performance and quality control standards required by a technical standard order (TSO). Installation of this article requires separate approval.

3.2.2 EFIS Standby Applications

If installation is being performed on an aircraft with a retro-fit EFIS/PFD installation, the FAA approved installation guidance for that product must be considered when installing the KI 300 as a backup to those installations. Compatibility with the primary EFIS/PFD must be evaluated and considerations may include:

- Electrical architecture (single / dual bus, multi-engine, etc)
- Independent power source requirements
- Electrical load analysis
- Mounting location relative to primary instrumentation
- Compatibility of airspeed, altitude, baro setting units relative to the primary instrumentation
- Compatibility of roll pointer (fixed pointer vs fixed scale)
- Compatibility of environmental qualification levels
- Compatibility of software design assurance levels (DAL)
- Compatibility of airspeed limitations (Mmo, variable Vmo/Vne or placarded limits)
- Compatibility of HIRF and lightning levels
- Compatibility of Functional Limitations (See section below)

3.2.3 Substitution of Rate-Of-Turn Indicator

The KI 300 may be eligible to replace the Rate-Of-Turn Indicator in certain applications. Refer to FAA AC 91-75 for additional details.

3.2.4 Battery Operation

The battery sub-system in the KI 300 is designed to fulfill the needs of an independent power source per 14 CFR 23.1353(h). Considerations are as follows:

- Automatic transition to battery will occur if the externally supplied power drops below approximately 7 VDC.
- A load-test is performed on each power-on cycle - a faulted battery indication will be shown if this test fails.
- Battery operational time is highly dependent on the ambient operating temperature and backlight intensity settings. See the specifications section in this document for minimum guaranteed operating time under different conditions.
- Reference the KI 300 Pilots Guide (PN 89000004-201) for additional details on battery operation.

3.2.5 Functional Dependencies

The KI 300 is not sensitive to external magnetic fields. Altitude indication requires correct static pressure. Airspeed indication requires both correct pitot and correct static pressure. Slip indication has no functional dependencies.

3.2.6 Operational Limitations

The following operational limitations apply:

- Geographic limitation: None
- Magnetic field sensitivity: None
- Lightning direct effects sensitivity: None
- Lightning indirect effects sensitivity: Approved for catastrophic functions
- HIRF Susceptibility: Approved for catastrophic functions
- Viewing Angle Limitations: 60° Left / Right, 45° Up / Down
- Displayable Vspeeds: Vne, Vno, Vfe, Vs1, Vso (Vmc, Vyse ME Only)
- Maximum displayable airspeed: 400 Knots / 460 Mph
- Minimum displayable airspeed: 30 Knots / 30 Mph
- Maximum displayable vertical speed range: -5,000 to 5,000 Feet/Min
- Minimum displayable vertical speed range: -100 to 100 Feet/Min
- Maximum displayable altitude: 35,000 Feet
- Minimum displayable altitude: -1,500 Feet

- Maximum configurable baro correction: 1050 mb / 31.00 inHg
- Minimum configurable baro correction: 948 mb / 28.00 inHg
- Minimum operational duration on battery: 30 Minutes
- Maximum roll rate: 400 degrees / second
- Maximum operating G force: 6 G
- Battery operation may be inhibited for up to 15 minutes during cold-starts. TSO performance is met within 10 minutes during cold-starts.
- No operational capability on internal battery is possible if the battery is faulted, as shown by a Red-X over the battery icon.
- Battery charging is disabled below approximately 0°C and above 40°C ambient, or when power input is below approximately 11 volts DC.
- If in-Flight alignment is attempted, it must be performed with wings-level non-accelerated flight conditions.

NOTE

APPROXIMATELY NINE PERCENT OF THE POPULATION HAS SOME SORT OF COLOR VISION DEFICIENCY (WHAT IS COMMONLY CALLED “COLOR BLINDNESS”). IT SHOULD ALSO BE NOTED THAT THE FAA DOES NOT TEST FOR ALL POTENTIAL COLOR DEFICIENCIES. (SOURCE TSO-C113a / AS8034)

3.2.7 TSO Deviations

TSO deviations are related to environmental test conditions and software certification basis. In both cases, the latest versions of RTCA DO-160 (Revision G) and RTCA DO-178 (Revision C) were utilized in lieu of older guidance.

In certain circumstances, this is a deviation from older TSO and associated MOPS guidance as follows:

TSO’s that reference older versions of DO-160:

- TSO-C2d § c(2)(viii) and corresponding MOPS AS8019 § 5
- TSO-C3e § 6 (g) and corresponding MOPS AS8004 § 5
- TSO-C8E § 6 (g) and corresponding MOPS AS8016A § 5

TSO’s that directly include a list of environmental specifications:

- TSO-C4c § 514.14 and corresponding MOPS AS396B § 3.3, § 3.4, § 3.5, § 4.4, § 7
- TSO-C10B § a(2)(ii) and corresponding MOPS AS392C § 3.3, §7

TSO’s that reference older versions of DO-178:

- TSO-C2d § a(3), §a(3)(i), § c(1)(xi), §c(2)(vii)
- TSO-C3e § 3(e), § 6(h)
- TSO-C113a § 3(e), § 6(g)

- TSO-C201 §3(e), § 6(g) and corresponding MOPS DO-334 § 2.1.7.2
- TSO-C8E §3(e), § 6(h)

The above deviations have been FAA approved.

3.2.8 Degraded Mode Operations

Errors will not exceed TSO limit specifications. When a cross check message is present, the KI 300 is considered to be in degraded mode. The TSO tested maneuvers represent typical flight. Degraded mode may occur if a pilot maintains an accelerated frame of reference (i.e. turns) for greater than 3 minutes.

Operation in this Degraded Mode does not imply that attitude availability from the KI 300 has been lost. During this Degraded Mode, attitude information is always available to the pilot - it is never removed or made un-available unless failure occurs.

When operating in this Degraded Mode, the KI 300 will show an attitude inaccuracies, on the order of ±3.0°. This condition will self-correct once the maneuver is completed.

The limited performance degradation in this mode meets the applicable performance requirements of TSO-C201/DO-334 § 2.2.4.2 (Degraded Mode Accuracy), 2.2.4.2.1 (Degraded Mode Pitch Accuracy), & 2.2.4.2.2 (Degraded Mode Roll Accuracy), for “basic attitude performance”, meaning it is sufficient to maintain positive aircraft control.

Therefore, for backup applications where air data is also utilized in the PFD solution, should air data become un-available in a common mode failure scenario, basic attitude performance is maintained by the KI 300. This is compliant with 14 CFR 23.1311 § (b) and applicable sections of AC 23-1311.1C.

Degraded Mode operation is defined by TSO-C201/RTCA DO-334 § 2.2.4 as follows:

> *The intended function of a degraded mode (if provided) is to provide basic attitude performance, despite one or more AHRS failures. A degraded mode is intended to allow a pilot to maintain positive aircraft control while maneuvering under IMC, including IFR en route operations, climbs, descents, holds, fly an instrument approach to minimums, and return the aircraft back to level following an upset.(…)*

3.3 Pneumatic Source

For operations in IFR conditions, TSO-C16a (or equivalent) pitot and pitot-static tubes must be utilized as the source of pitot and static air pressure.

3.4 Cooling Considerations

The KI 300 does not require any special cooling considerations.

3.5 Available Equipment

Table 3-1: KI 300 Base Unit Package

Description	P/N	Software P/N
KI 300 Electronic Attitude Indicator	89000004-100-00	901099 Version 18.0
KI 300 Battery Pack	89500004-120	N/A

3.6 Installation Materials

3.6.1 Accessories Available from BendixKing

Table 3-2: KI 300 Accessories and Installation Kits

Description	P/N	Note
KI 300 Battery Pack	89500004-120	May be purchased separately
KI 300 Installation Kit	89000004-103	

Table 3-3: KI 300 Installation Kit (PN 89000004-103)

Description	P/N	Note
KI 300 Front Mounting Bracket Kit	89500004-100	
KI 300 Installation Connector Kit	89400004-101	Not used when the KI 300 will be installed with the KA 310.

Table 3-4: KI 300 Front Mounting Kit (PN 89500004-100)

Description
Front Mounting Bracket
Gasket, Vibe
Rear Mounting Bracket
Screw, Phillips, Flat Undercut SS (X4) 6-32 x 3/8
Nut, Nylon Insert, Std Zinc (X4) 6-32
Hex Wrench, 3/32” L-WR Short

3.6.2 Materials Required But Not Supplied

The KI 300 is intended for use with standard aviation accessories. The following items are required for installation but not supplied:

Table 3-5: Installation Materials Required But Not Supplied

Description	P/N or Specification	Quantity
Wire 22 AWG	M22759/16*	As Required
Circuit Breaker (manually resettable) 2 amp	MS3320 or equivalent aviation grade	1
Pitot & Static Tubing	Commercially Available	As Required
Pitot & Static T-Fittings	Commercially Available	As Required
Tie Wraps or Lacing Cord	Commercially Available	As Required

* Or equivalent

3.6.3 Tools Required But Not Supplied

The following tools are required for installation but not supplied:

Table 3-6: Tools Required But Not Supplied

Description	P/N or Specification
Screwdriver	Commercially Available
Torque Wrench	Commercially Available
Milliohm Meter	Commercially Available
For DB-9 Connectors	
Insert/Removal Tools	M81969/14-02 (Red and White)
Crimp Tool	M22520/2-01 (DMC AFM8)
Crimper Turret Head	M22520/2-06 (K13-1 Turret)

3.7 Unpacking and Inspection

Exercise extreme caution when unpacking the equipment. Do a visual inspection of the KI 300 unit for evidence of damage incurred during shipment. If a damage claim must be filed, save the shipping container and all packing materials to substantiate your claim. The claim must be filed as soon as possible. Confirm receipt of all installation components refer to, Table 3-1, Table 3-2 and Table 3-3 for the appropriate part lists. Inspect all components for any damage, contact BendixKing Customer Support if any parts are missing or damaged. The shipping container and all packing materials must be retained in the event that storage or reshipment of the equipment is necessary.

NOTE

THE KI 300 EXTERNAL CONNECTORS SHOULD BE PROTECTED WITH AN ESD COVER WHEN NOT INSTALLED ON THE AIRCRAFT.

3.8 Handling Considerations

The KI 300 incorporates sensitive sensor elements that may be damaged or degraded by improper handling. Observe the following prior to and during installation:

- Do not apply excessive pressure or vacuum to either the pitot or static pressure ports
- Do not insert objects into the pressure ports (other than approved fittings)
- Do not drop, jar or otherwise mechanically shock the unit
- Do not scratch or otherwise mar the display or surrounding bezel
- Clean the display only with products approved for LCD screens
- Do not drop, puncture or otherwise tamper with the battery pack

4 INSTALLATION PROCEDURES

4.1 General

Installation consists of securely fastening the mounting bracket to the instrument panel, constructing & connecting the power cable assembly, constructing & connecting the pneumatic lines, installing the vibration gasket and mounting the unit to the bracket. Power-On is then performed, followed by unit configuration and finally unit checkout procedures.

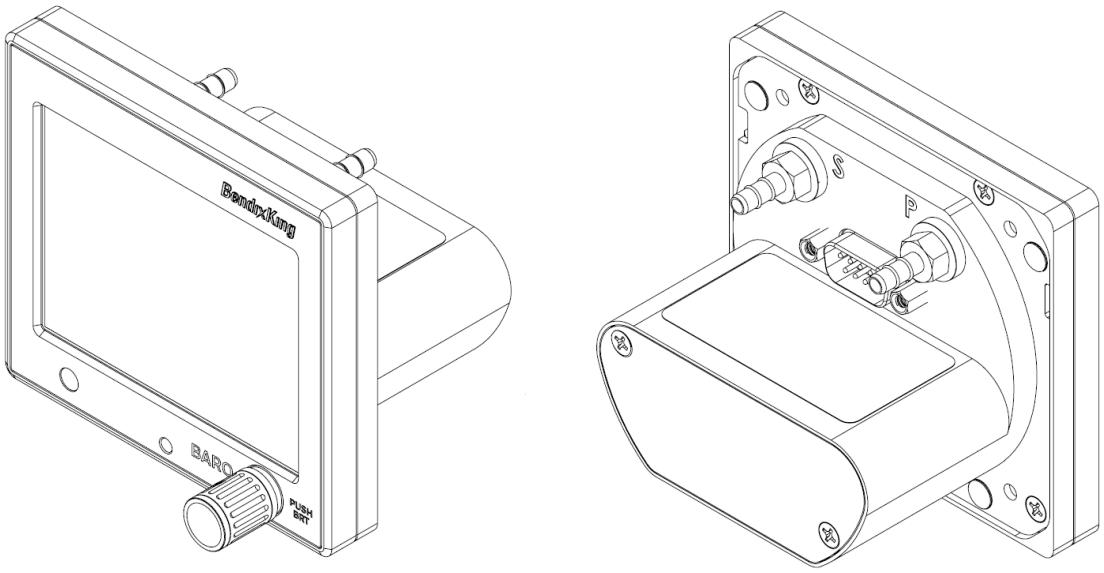


Figure 4-1 Unit Front and Rear Views

4.2 Mounting Hole

The KI 300 is designed to mount in a standard 3” round mounting hole. The supplied front mounting bracket and rear mounting bracket (Kit PN 89500004-100) must be utilized to mount the instrument. When replacing a KI 256, an adapter plate (PN 89500004-102) is included in the KA 310 Installation Kit. The panel cutout should be as follows:

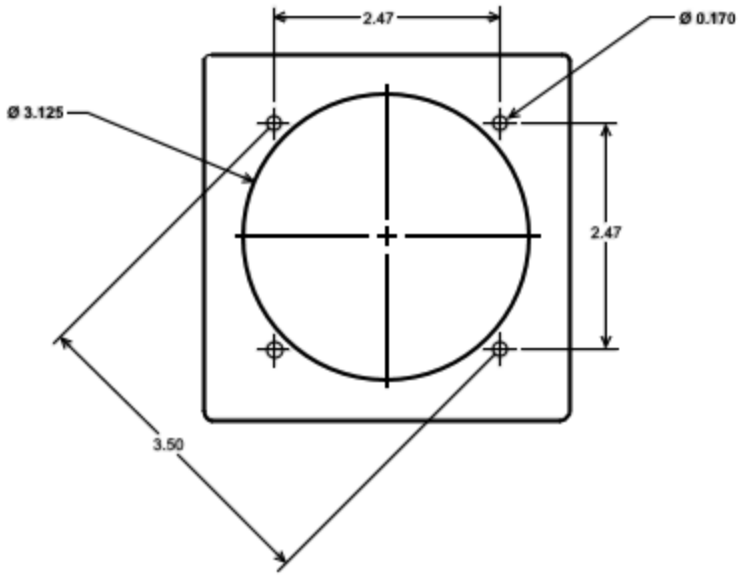


Figure 4-2 Instrument Cutout

Front and rear mounting brackets adapt the unit connection points to the 3” round instrument hole cutout. The front bracket is constructed of stainless steel, and should be inspected prior to installation to insure general flatness. The rear bracket is utilized to fasten the unit to the panel. The supplied screws and nuts must be used to retain the brackets.

4.3 Mounting Bracket Installation

1. Inspect the mounting bracket to ensure general flatness and integrity.
2. Remove any paint from REAR of instrument panel around the nut-to-panel interface points – the mounting bracket must be fully grounded to the instrument panel.
3. Install the bracket and tighten the four screws and nuts. Ensure that the bracket is level relative to the aircraft while the nuts are being tightened.
4. Minor roll error can be corrected by slightly rotating the bracket prior to tightening and during the configuration of the unit.

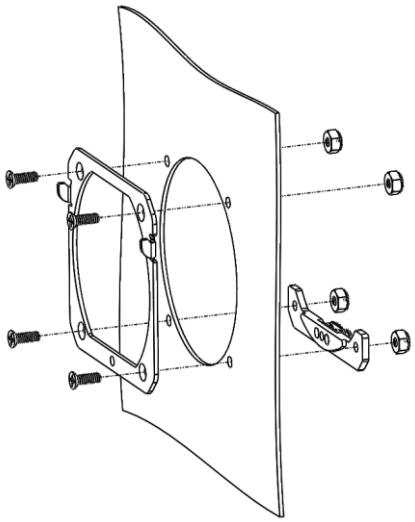


Figure 4-3 Front and Rear Mounting Bracket

Electrical bonding must be carefully considered when installing the mounting bracket to the instrument panel, as this is the primary grounding mechanism for High-Intensity Radiated Fields (HIRF) and lighting protection.

The mounting bracket must remain un-painted and be bonded to the aircraft frame (or equivalent for composite aircraft) with a resistance of 2.5 milliohms or less. This can be achieved by cleaning and/or removing paint from the rear side of the instrument panel where the retaining nuts make contact with the panel structure.

4.4 Wiring Installation

1. Construct the power and ground lines utilizing aviation grade 22 AWG, non-shielded, stranded wire.
2. The power line must be protected by a 2 AMP circuit breaker.
3. Keep power and ground lines less than 1 meter in length.

The KI 300 is supplied with one 9 pin Sub-D female mating connector and back-shell. The Sub-D connector uses screw lock assemblies to secure the connector to the unit.

Figure 4-4 Sub-D Back-Shell

All electrical connections are made on the single rear mounted 9 pin Sub-D. Connections indicated as Reserved - Do Not Connect (DNC) should not be connected in the installation. Power and ground are applied to pins 5 and 9 respectively.

Table 4-1: KI 300 Electrical Pin Out

PIN #	FUNCTION	TYPE	NOTES
1	Serial 1 RX	Input	Serial Bus – KA 310
2	Serial 1 TX	Output	Serial Bus – KA 310
3	Serial 0 RX	Input	Reserved – DNC
4	Serial 0 TX	Output	Reserved – DNC
5	**Power +**	**Power**	**Main Power Input**
6	Select	Input	Reserved – DNC
7	V Battery	Output	Reserved – DNC
8	Serial Ground	Signal	Serial Bus - Ground
9	**Power Return-**	**Ground**	**Main Power Ground**

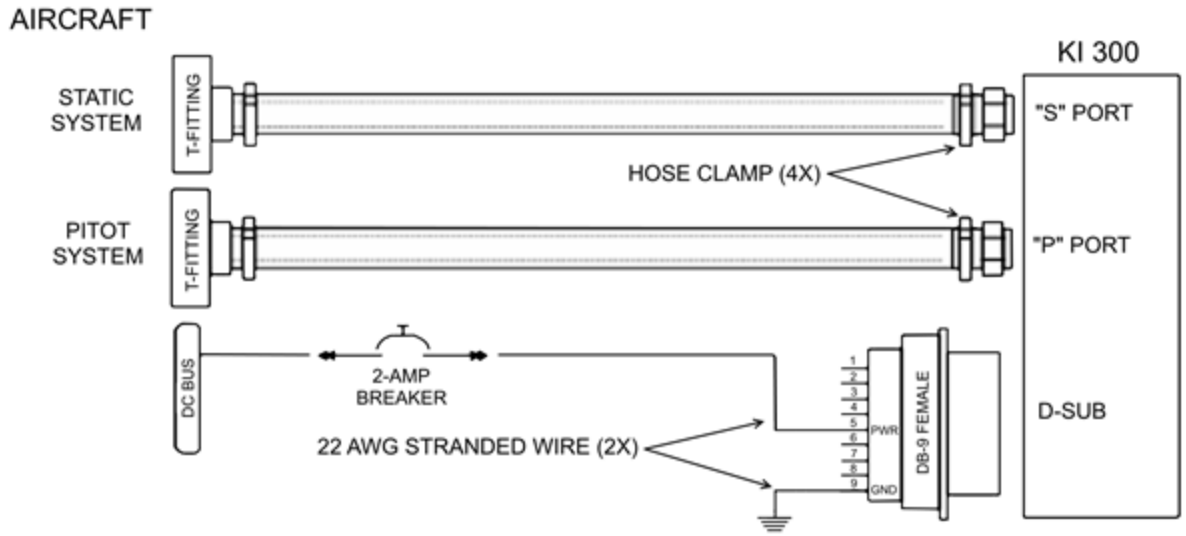


Figure 4-5 Wiring Diagram

4.5 Pneumatic Line Installation

1. Tap into the Pitot and Static lines of the aircraft with appropriate t-fittings (not supplied).
2. Construct the pneumatic lines ensuring that sufficient service loop is accounted for to allow the unit to be easily removed from the front of the panel and access to the battery can be achieved without disconnecting the pneumatic lines.
3. Connect the Pitot line to the rear of the unit on the fitting labeled “P”.
4. Connect the Static line to the rear of the unit on the fitting labeled “S”.

The pitot and static connections are provided by two 1/16 NPTF fittings on the rear of the unit. Also supplied are two 0.17” ID barbed fittings for optional usage.

Alternate adaptors may be required to interface to existing pitot and static lines, of which standard AN fittings should always be used. If application of thread sealant is required, “sensor safe” chemicals must be utilized.

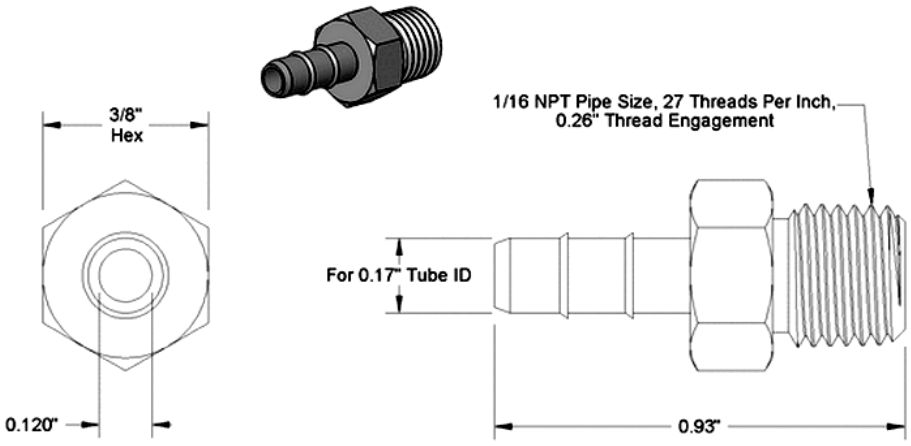


Figure 4-6 Supplied Pneumatic Fitting

When selecting alternate fittings, do not allow the threads to penetrate more than 0.3 inches into the unit, otherwise sensor damage will occur. Do not remove the foam filter located in the body of the unit.

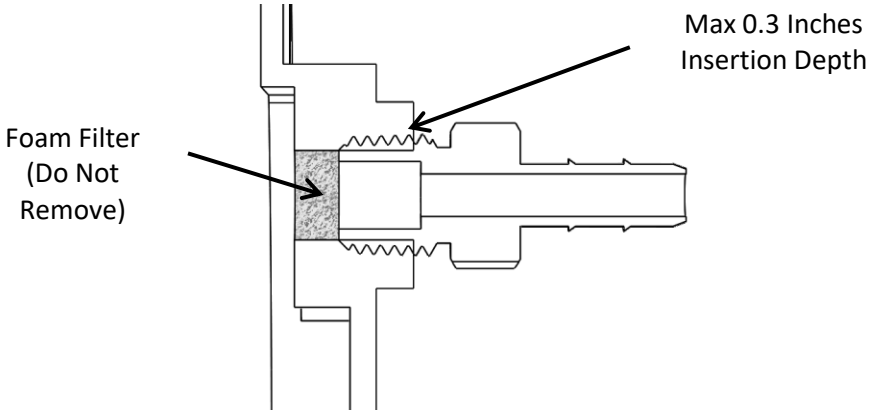


Figure 4-7 Thread Depth Limit

4.6 Unit Mounting

1. The unit connects to the mounting bracket utilizing two upper tabs and a lower fastener.
2. Place vibration gasket on unit before installing unit onto bracket.
3. The unit is installed by engaging the two upper tabs first, then securing the bottom screw.
4. Hold the unit at a slight angle off of the instrument panel (as shown below) and align the upper tabs with the slots on the rear of the unit.

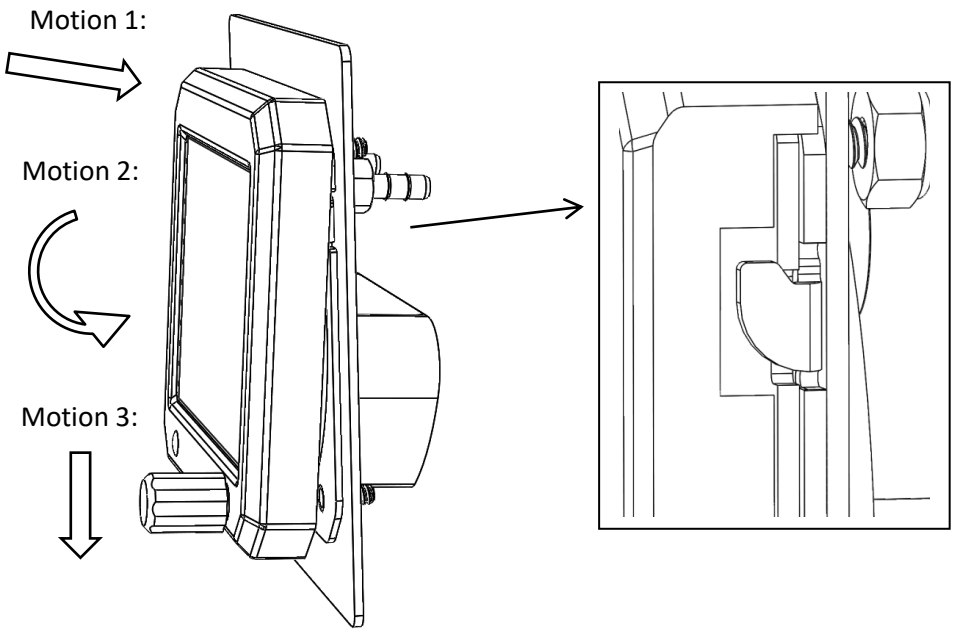


Figure 4-8 Unit Mounting With Tab/Slot Cutaway

5. Push the unit toward the instrument panel until it stops against the bracket.
6. While maintaining inward pressure, rotate the bottom such that the unit is now parallel to the panel.
7. Once parallel to the panel, apply downward pressure to ensure the upper tabs remain fully engaged.
8. While holding in-ward and down-ward pressure on the unit, tighten the lower screw with the 3/32 hex drive. Torque to 5 inch-lbs.

CAUTION

DO NOT OVER TIGHTEN

9. Verify that the unit is firmly attached and completely parallel to the instrument panel. (The bezel of the unit will stand-off slightly from the instrument panel, which is normal.)

4.7 System Configuration

The following section provides instructions for initial setup configuration of the KI 300. For complete operation guide, including normal and abnormal operation, see the Pilot Guide (PN 89000004-201).

4.7.1 Initial Power On

Upon normal power-on, the unit will display the company logo, battery status and software version as follows:

Figure 4-9 Power On Screen

If the unit does not power-on, check the following:

- Ensure power and ground connections are correct.
- Verify the breaker is in the on position and applying power to the unit.
- Verify the supply voltage is greater than 10V DC.
- Verify the integrity of all electrical connections.
- Test independent operation by removing the unit and powering from a dedicated cable and bench power source.

After displaying the splash screen for approximately 25 seconds, the unit will enter the main operating mode.

4.7.2 Entry & Exit From Setup Mode

Setup mode is enabled when the unit is powered-on while the rotary knob is being held in the pressed state. After verifying basic power-on, cycle power to the unit and enter the setup mode. Upon successful entry into the setup mode, the startup screen will be bypassed and a series of setup menus will become available. The rotary knob can then be released once the setup mode is indicated.

Figure 4-10 Setup Mode Menu

Exiting the setup mode is accomplished by navigating to the last setup page and selecting YES, and then pressing the rotary knob.

While in the setup mode, the unit is fully operational and will continue through the sensor stabilization functions. Once stabilized, all displayed parameters will be shown, and any adjustments (such as roll/pitch trim, IAS speed markings, etc), will all be updated real-time with user adjustment. This can be useful for trimming certain parameters such as airspeed and altitude trim.

Each pages' value is internally stored when the corresponding page is exited, not upon exit of the last page.

4.7.3 Setup Pages

A total of 29 setup pages are available as follows:

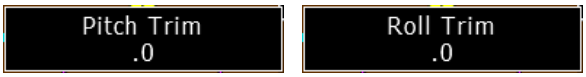
Table 4-2: KI 300 Setup Parameters

Setup Page	Purpose	Min Value	Max Value	Increment	Reference Section
Pitch Trim	Used to adjust for various panel tilts.	-45°	+45°	0.1°	4.7.3.1
Roll Trim	Used to adjust for minor variations in roll.	-5°	+5°	0.1°	4.7.3.1
Panel Type	Hard Mount / Float Mount	Hard	Float	n/a	4.7.3.2
ADC Display	Used to enable/disable Airspeed and Altitude tapes (IAS/BCA, IAS Only, BCA Only, No IAS/BCA)	n/a	n/a	n/a	4.7.3.3
ADC Calibration	Enter Air Data Computer (ADC) Calibration? No skips to Vs0 menu item.	No	Yes	n/a	4.7.3.4
IAS Trim @ 30 knots	Used to adjust for minor variations in airspeed at 30 knots.	-50	+50	1kt or mph	4.7.3.4
IAS Trim @ 400 knots	Used to adjust for minor variations in airspeed at 400 knots.	-50	+50	1kt or mph	4.7.3.4
ALT Trim @ 0 ft	Used to adjust for minor variations in altitude at 0 ft.	-999 ft	+999 ft	1ft	4.7.3.4
ALT Trim @ 35,000 ft	Used to adjust for minor variations in altitude at 35,000 ft.	-999 ft	+999 ft	1ft	4.7.3.4
Vs0	Used to set Vs0 band on IAS indicator.	0	400	1 kt or mph	4.7.3.5
Vs1	Used to set Vs1 band on IAS indicator.	0	400	1 kt or mph	4.7.3.5
Vfe	Used to set Vfe band on IAS indicator.	0	400	1 kt or mph	4.7.3.5
Vno	Used to set Vno band on IAS indicator.	0	400	1 kt or mph	4.7.3.5
Vne	Used to set Vne band on IAS indicator.	0	400	1 kt or mph	4.7.3.5
Vyse	Used to set Vyse mark on IAS indicator. 0 Disables.	0	400	1 kt or mph	4.7.3.5
Vmc	Used to set Vme mark on IAS indicator. 0 Disables.	0	400	1 kt or mph	4.7.3.5
IAS Units	Used to set units for IAS (KTS or MPH)	n/a	n/a	n/a	4.7.3.6
Baro Units	Used to set baro units (inHg or Mb)	n/a	n/a	n/a	4.7.3.7
Baro Default	Used to set default baro settings (STD, AUTO, LAST)	n/a	n/a	n/a	4.7.3.8
IVSI Damping	Used to disable display of IVSI, or enable IVSI. Also used to set the display filtering. (OFF, 0..10 seconds)	0 sec	10 sec	1 sec	4.7.3.9

Setup Page	Purpose	Min Value	Max Value	Increment	Reference Section
Slip/Skid Type	Used to set the slip/skid indicator type. (BALL, POLYGON, BOTH)	n/a	n/a	n/a	4.7.3.10
Diagnostic Mode	Used for diagnostic purposes. Should remain "No" unless requested by the factory.	No	Yes	n/a	4.7.3.11
AP Type	Used to select the autopilot interface when the KI 300 is connected to the KA 310 (None, Analog, Analog w/FD, Digital)	n/a	n/a	n/a	4.7.3.12
Software Part Numbers	Used to verify the correct software part numbers for the KI 300 and KA 310	n/a	n/a	n/a	4.7.3.13
AP Alignment	Used for autopilot alignment when the KA 310 is connected to a legacy (analog) autopilot. (No, Yes)	n/a	n/a	n/a	4.7.3.14
AP Align Pitch	Used to set the Pitch output value for autopilot alignment	-60 degrees	+60 degrees	1 degree	4.7.3.15
AP Align Roll	Used to set the Roll output value for autopilot alignment	-60 degrees	+60 degrees	1 degree	4.7.3.15
Yaw Rate Alignment	This allows installation to manually check rudder movement.	+20 deg/sec	-20 deg/sec	1 degree/sec	4.7.3.16

4.7.3.1 Pitch Trim and Roll Trim

The pitch trim and roll trim are used to make adjustments for various aircraft panel tilts and variations in roll offsets. The aircraft should be leveled per the aircraft maintenance manual to determine the offset values. After the aircraft is level, enter the appropriate pitch and roll trim values in the setup menu by turning the rotary knob to the value that levels the ownship symbol on the KI 300 display and then pressing in the knob to move to the next menu item.



4.7.3.2 Panel Type

If the aircraft panel is mounted on vibration absorbing shock mounts, select "Float" as the Panel Type within the setup pages, otherwise select "Hard".

4.7.3.3 ADC Display

The air data displayed on the KI 300 has four options:

- Display of both the indicated airspeed and baro corrected altitude
- Display of only indicated airspeed
- Display of only baro corrected altitude
- No air data displayed.

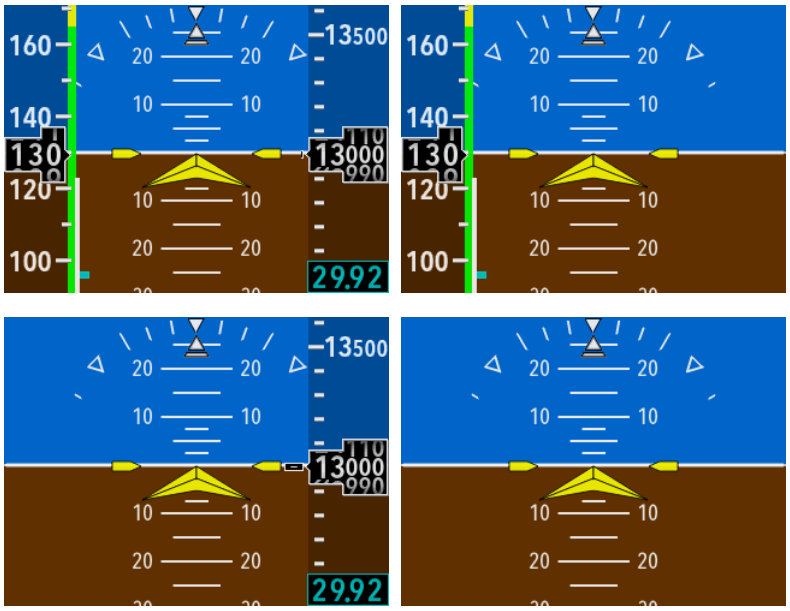


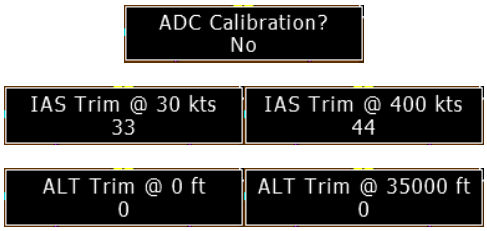
Figure 4-11 KI 300 Air Data Display Options

Select the preferred display option by turning the rotary knob and then pressing in the knob to save the value and move to the next menu item.

The air data display setting selected is pilot preference, and the configuration should be communicated to the operator.

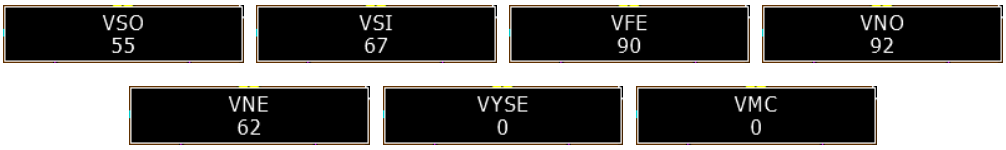
4.7.3.4 ADC Calibration

Refer to sections 5.4.2 Airspeed Trim Procedure and 5.4.3 Altitude Trim Procedure for performing the ADC Calibration.



4.7.3.5 V Speed Settings

Refer to the aircraft flight manual and enter the appropriate v-speeds by turning the rotary knob and then pressing in the knob to save the value and move on to the next menu item.



(Example Values Only)

4.7.3.6 IAS Units

The indicated airspeed can be displayed in either knots (KTS) or miles per hour (MPH)

Select the preferred IAS units option by turning the rotary knob and then pressing in the knob to save the value and move on to the next menu item.

The airspeed units setting selected is pilot preference, and the configuration should be communicated to the operator.

4.7.3.7 Baro Units

The baro setting can be displayed in either inches of Mercury (inHg) or millibars (mb)

Select the preferred Baro units option by turning the rotary knob and then pressing in the knob to save the value and move on to the next menu item.

The baro units setting selected is pilot preference, and the configuration should be communicated to the operator.

4.7.3.8 Default Baro Setting

The default baro setting can be selected between Standard (STD), Automatically estimated (AUTO), or last pilot set value (LAST).

STD will default to 29.92 InHg (or 1013 Mb) at power up. AUTO will utilize the airport elevation on the last power-down to estimate a current baro setting at the next power up. LAST will retain the last pilot entered value at power up.

The setting selected is pilot preference, and the configuration should be communicated to the operator.

4.7.3.9 IVSI Damping

The IVSI damping can be set between 0 and 10 seconds or OFF. The IVSI damping sets the filtering value on the instantaneous vertical speed indication. If IVSI is set to OFF, no vertical speed indication will be displayed.

Select the preferred IVSI damping option by turning the rotary knob and then pressing in the knob to save the value and move on to the next menu item.

The IVSI damping setting selected is pilot preference, and the configuration should be communicated to the operator.

4.7.3.10 Slip/Skid Type

The slip/skid indicator displayed on the KI 300 has three options:

- Display of a ball indicator at the bottom of the display
- Display of a polygon at the top of the attitude indicator
- Display of both the ball and polygon

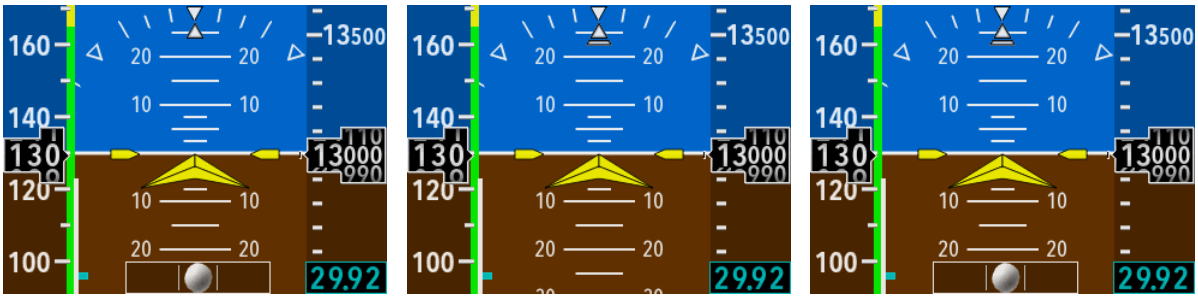


Figure 4-12 KI 300 Slip/Skid Indicator Display Options

Select the preferred slip/skid indication option by turning the rotary knob and then pressing in the knob to save the value and move on to the next menu item.

The slip/skid indication setting selected is pilot preference, and the configuration should be communicated to the operator.

4.7.3.11 Diagnostic Mode

Used for diagnostic purposes. Should remain “No” unless requested by the factory.

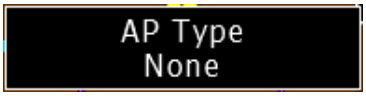
When diagnostic mode is active, the system will display the following values:

- Accelerometer Leak value
- Turn detection indicator
- Lurch detection indicator
- DCM Error Timer expiring (progress bar)
- Starvation Timer expiring (progress bar)
- Bias Tracking indication (one for each axis)

4.7.3.12 Autopilot Type

When the KI 300 is connected to the KA 310 the type of autopilot must be configured. There are four options:

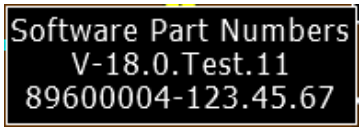
- None – This option is selected when the KI 300 is not connected to the KA 310 or when the KI 300 is connected to the KA 310 and the KA 310 is not connected to an autopilot.
- Analog – This option is selected when the KI 300 is connected to the KA 310 and the KA 310 is connected to a BendixKing legacy (analog) autopilot that does not include flight director functionality.
- Analog w/FD – This option is selected when the KI 300 is connected to the KA 310 and the KA 310 is connected to a BendixKing legacy (analog) autopilot that includes flight director functionality.
- Digital - This option is selected when the KI 300 is connected to the KA 310 and the KA 310 is connected to a BendixKing autopilot that uses digital communication.



The setting selected is determined by the type of autopilot installed in the aircraft.

4.7.3.13 Software Part Numbers

This menu option does not allow any configuration settings. It is used to verify the current software part number of the KI 300 and also the KA 310 when connected to the KI 300.



(Example Only)

4.7.3.14 AP Alignment

When the KI 300 is connected to the KA 310 and the KA 310 is interfaced to a BendixKing legacy (analog) autopilot, an autopilot alignment must be completed. Refer to the KA 310 AML STC Installation Manual PN 89000004-200 for details.

4.7.3.15 AP Align Pitch/AP Align Roll

The AP Align Pitch and AP Align Roll allow manual control of the pitch and roll attitude output for the KI 300. This is used during autopilot alignment. Refer to the KA 310 AML STC Installation Manual PN 89000004-200 for details.

4.7.3.16 Yaw Rate Alignment

This allows installation to manually check rudder movement. Refer to the KA 310 AML STC Installation Manual PN 89000004-200 for details.

5 INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

5.1 ICA General

The following Instructions for Continued Airworthiness (ICA) are to be utilized by approved mechanics. The instructions contained here-in are required to ensure proper unit functionality and performance on an on-going basis.

5.2 Airworthiness Limitations

The Airworthiness Limitations section is FAA approved and specifies maintenance required under §§ 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

5.2.1 Battery Limitations

The battery must be replaced when any of the following occurs:

- The battery fails the power-on self-test as indicated by a Red-X over the on-screen battery icon.
- The battery fails to charge during normal operation.
- The battery fails the full-duration load test (described below).
- The battery pack is over 5 years old, as measured by the battery pack installation date.

5.2.2 Altimeter Limitations

The altimeter function must be tested and inspected in accordance with 14 CFR 91.411.

5.3 Battery Maintenance

The KI 300 contains a field-replaceable Li-Poly battery pack. This battery requires periodic replacement to ensure sufficient capacity is available to meet performance specifications.

5.3.1 Full Duration Load Test

This test performs a full-discharge cycle to ensure that proper capacity is available. A degraded or aged battery will be detected by this procedure.

CAUTION

THIS PROCEDURE MUST BE PERFORMED EVERY 24 MONTHS.

1) This test is to be done at ambient temperature ranging from +50°F (+10°C) to +90°F (+26°C). The unit must be fully thermally stabilized in this range.
2) Ensure battery is fully charged by verifying that a charge of 100% is shown. If not, charge as follows:
    a. Place the aircraft on ground-power and turn the unit on.

b. Allow the battery to fully charge to 100% and verify that the battery charging symbol is no longer presented. (Battery charging may continue for a short duration even though 100% is shown).

3) Set the display to full-intensity by pressing the rotary knob and rotating clockwise as needed. Press the knob again to dismiss the brightness menu.

4) Remove power to the unit by pulling the corresponding circuit breaker and cancel the power-down sequence by pressing the knob.

5) Note the current time and allow unit to operate for 2 hours. At the end of the 2 hour period, if the unit has shut-down, or on-screen parameters are Red-X'ed, the battery must be replaced.

5.3.2 Battery Replacement Procedure

The following procedure is to be used to replace the battery pack. The battery pack consists of 4 individual cells with protection and heater circuitry all enclosed in a PVC wrapping. Two sets of leads are present: 1) Heater Leads, and 2) Battery Power Leads.

CAUTION

DO NOT INADVERTENTLY CONNECT THE BATTERY TO THE HEATER CONNECTOR. IDENTICAL CONNECTORS ARE UTILIZED FOR EACH. FOLLOW THE INDICATED COLOR CODING. DAMAGE TO THE UNIT MAY OCCUR.

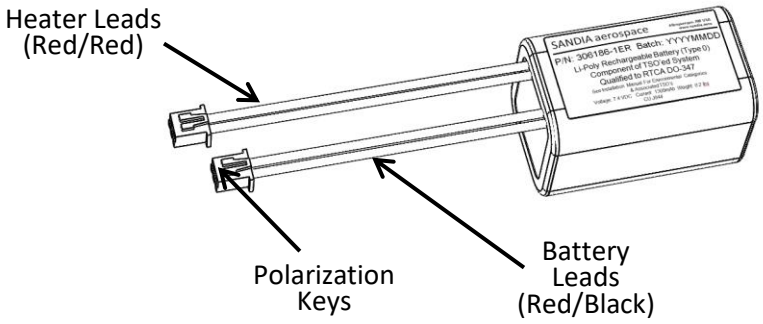


Figure 5-1 Li-Poly Battery Pack

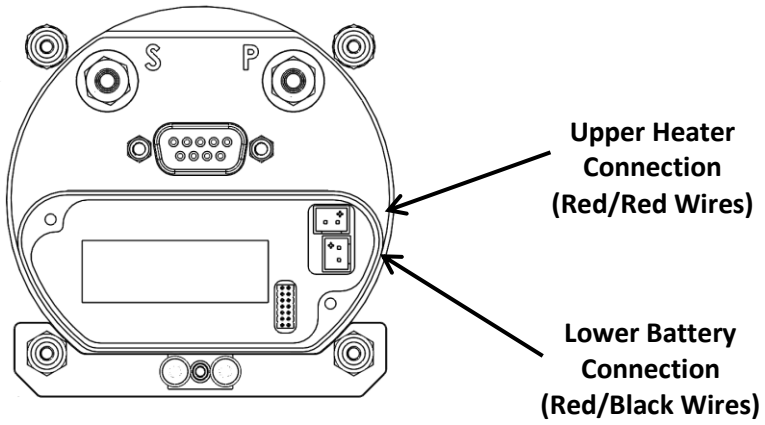


Figure 5-2 Li-Poly Battery Connections

1. Only the approved batteries are to be used. See specification section of this document for the applicable BendixKing part number(s).
2. Ensure power is not supplied to the unit by either pulling the applicable circuit breaker, or turning off the master switch. (Ensure the unit is not running on battery)
3. Remove the unit from the aircraft instrument panel - it is not required to disconnect the power cable or pitot/static lines unless in-adequate service loop was provided.
4. Carefully remove and retain the two Phillip's head screws that retain the battery cover.
5. Extract the battery pack.
6. Grasp the leads in pairs and gently pull the connectors loose from the unit. Do not pull excessively on just one individual wire. The connector is a high-friction fit connector, but does not utilize a specific un-latching mechanism.
7. Discard the old battery pack per local regulations as related to Li-Poly battery procedures.
8. Position the new battery pack such that with the tip of one finger, the connectors can be firmly pressed into place.
9. Observe the polarity lock on each connector – Note that the same connector is utilized for each function and must not be connected incorrectly.
10. Connect the longer red/red heater connector first into the upper mating connector – ensure the connector fully seats with a click.
11. Connect the shorter red/black power connector secondly into the lower mating connector – ensure the connector fully seats with a click.

12. Loop the excess wire into the cavity co-located with the battery connector. Do not run the excess wire adjacent to, over, or under the battery pack itself.
13. Insert the battery pack into the battery cavity with the label facing the battery cover.
14. Replace the battery cover, tighten the screws firmly into position. Take care to ensure that the battery wires are fully contained within the battery compartment, and do not get pinched under the battery cover plate.
15. Re-install the unit following the procedures defined in this manual.
16. Note the date of battery replacement in the aircrafts log book. The age of the battery is determined by the placed-in-service date, not manufacture date.
17. New battery packs will not have full charge. The battery pack should be fully charged prior to re-entry into service.

5.4 Airspeed and Altimeter Test & Calibration

Both the airspeed and attitude sensors have the ability to be tested and calibrated in the field. Greater accuracy will be obtained by allowing the unit to fully stabilize in the on-state for a period of approximately 5 - 10 minutes prior to determining any required adjustments.

5.4.1 Altimeter System Test and Inspection

This procedure should only be performed utilizing a calibrated air-data test set. The physical connection (pitot and static) of the air-data test set is identical to that of traditional mechanical instruments. No vibration is required to be applied to the unit during testing or calibration.

NOTE

THE KI 300 MUST BE CALIBRATED EVERY 24 MONTHS PER CFR 91.411.

CAUTION

IF OTHER INSTRUMENTS ARE CONNECTED TO THE PITOT STATIC SYSTEM THAT CANNOT HANDLE AN AIRSPEED INPUT OF 400 KTS, THE KI 300 MUST BE REMOVED FROM THE AIRCRAFT AND THE AIRSPEED TRIM PROCEDURE MUST BE COMPLETED ON THE BENCH.

5.4.2 Airspeed Trim Procedure

1. Connect the pitot-static test set to the aircraft static system. The KI 300 must be connected to the aircraft static system.
2. Apply power to the KI 300 while holding the pushbutton down in order to enter setup mode and allow the internal encoder to stabilize.

3. Ensure the Baro setting is 29.92 inches of mercury. (This may require disabling the AUTO Baro feature and starting this procedure from the beginning.)
4. Proceed to the “ADC Calibration?” page and choose “Yes”. Then proceed to the “IAS Trim @ 30 kts” page.
5. Configure the pitot-static test set to obtain an airspeed reading of 30 kts.
6. On the KI 300, adjust the trim setting until the airspeed tape reads 30 kts, then press the knob to proceed to the “IAS Trim @ 400 kts” page.
7. Configure the pitot-static test set to obtain an airspeed reading of 400 kts.
8. On the KI 300, adjust the trim setting until the altitude tape reads 400 kts, then press the knob to proceed to the next setup page.

CAUTION

IF OTHER INSTRUMENTS ARE CONNECTED TO THE PITOT STATIC SYSTEM THAT CANNOT HANDLE AN ALTITUDE INPUT OF 35,000 FT, THE KI 300 MUST BE REMOVED FROM THE AIRCRAFT AND THE ALTITUDE TRIM PROCEDURE MUST BE COMPLETED ON THE BENCH.

5.4.3 Altitude Trim Procedure

1. Connect the pitot-static test set to the aircraft static system. The KI 300 must be connected to the aircraft static system.
2. Apply power to the KI 300 while holding the pushbutton down in order to enter setup mode and allow the internal encoder to stabilize.
3. Ensure the Baro setting is 29.92 inches of mercury. (This may require disabling the AUTO Baro feature and starting this procedure from the beginning.)
4. Proceed to the “ADC Calibration?” page and choose “Yes”. Then proceed to the “ALT Trim @ 0 ft” page.
5. Configure the pitot-static test set to obtain an altimeter reading of 0 feet.
6. On the KI 300, adjust the trim setting until the altitude tape reads 0 feet, then press the knob to proceed to the “ALT Trim @ 35,000 ft” page.
7. Configure the pitot-static test set to obtain an altimeter reading of 35,000 feet.
8. On the KI 300, adjust the trim setting until the altitude tape reads 35,000 feet, then press the knob to proceed to the next setup page.

6 TROUBLESHOOTING

The following information can be utilized to recognize and correct probable malfunctions.

Table 6-1: KI 300 Troubleshooting

Symptom	Possible Solutions
Attitude remains Red-X'ed	• Ensure proper supply power is available. • Return unit for service.
Airspeed remains Red-X'ed	• Ensure proper supply power is available. • Ensure airspeed limit has not been exceeded. • Return unit for service.
Altitude remains Red-X'ed	• Ensure proper supply power is available. • Ensure altitude limit has not been exceeded. • Return unit for service.
Battery icon is Red-X'ed	• Ensure battery is correctly installed. • Perform battery load test. • Replace battery. • Return unit for service.
Battery icon is Red-X'ed	For deeply discharged batteries, pre-charge as follows: 1. Apply power for 10 minutes 2. Momentarily remove power 3. Re-apply power. 4. Verify charging cycle starts correctly.
On Ground, Cross-Check remains annunciated	• Ensure proper supply power is available. • During power-on, ensure minimal aircraft motion is present. • Return unit for service.
Aligning message remains annunciated	• Ensure proper supply power is available. • During power-on, ensure minimal aircraft motion is present. • Return unit for service.
Altitude shows error	• Perform altitude trim procedure. • Return unit for service.
Airspeed shows error	• Perform airspeed trim procedure. • Return unit for service.
Attitude shows error	• Set panel tilt correctly. • Set roll trim correctly. • Return unit for service.
IVSI shows constant offset	• Set panel tilt correctly. • Set roll trim correctly. • Return unit for service.
Memory Error is shown	• Return unit for service.