



RCA15 SERIES

ELECTRIC DIRECTIONAL GYRO

INSTALLATION/OPERATION GUIDE



RCA15EK-1



RCA15EK-2



RCA15AK-16

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REVISION DETAIL

REVISION	DATE	DETAIL
A	01/30/2019	Initial Release
B	04/30/2025	Added: Instructions for Continued Airworthiness (Apendex A, page 8)

SECTION 1: INSTRUMENT DESCRIPTION

1.1 GENERAL DESCRIPTION

The RCA15 Series Electric Directional Indicator employs an electrically driven gyro motor and is a direct reading, azimuth indicator. Rotor run up time is 3 minutes. They have a built-in inverter which converts aircraft DC power to the required AC voltage and frequency. An AC brush-less motor ensures longer instrument life. May be used in both fixed wing and rotor wing aircraft.

The RCA15EK model is a multi-volt model which is capable of operating on either a 14VDC or a 28VDC system. This allows the EK instruments to operate at a lower voltage than other models.

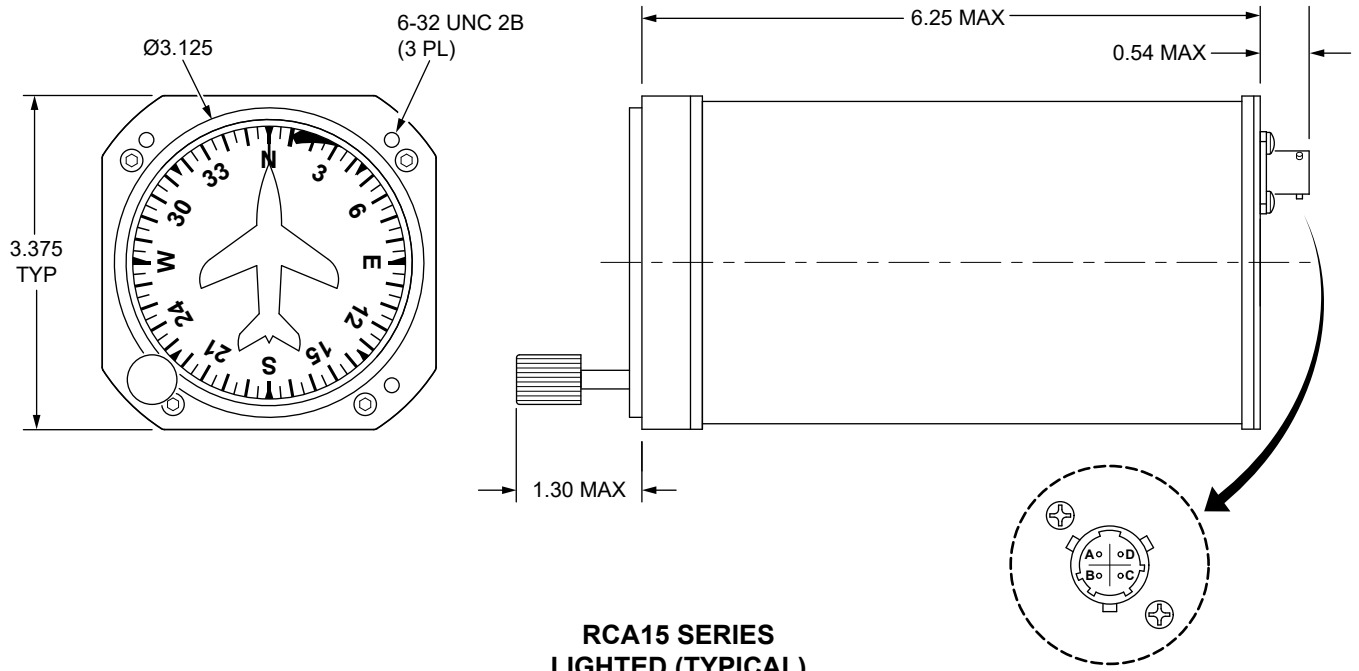
All models fit in a standard 3 1/8" panel cut-out. Weight is 2.3 lbs. maximum. Power failure flag drops into view when supply voltage is lost or has dropped below a level for proper operation of the gyro. Internal lighting with select models. Mating connector MS3116E8-4S. Matched companion to the RCA26 Horizon Series.

1.2 PHYSICAL DESCRIPTION

The **RCA15** Electric Directional Gyro is a direct reading instrument which provides a visual display of aircraft heading. Refer to table 1.1 below for leading particulars.

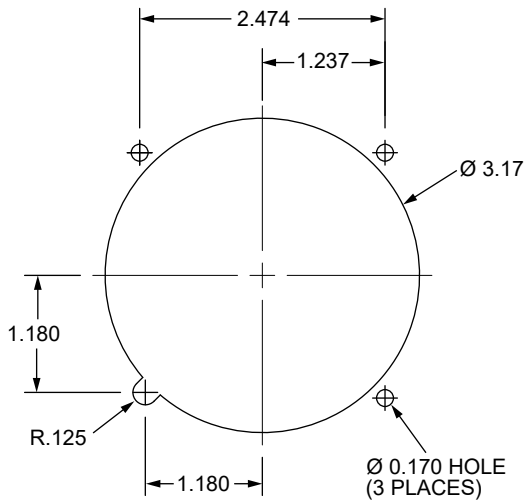
<u>OPERATING VOLTAGE</u>	(RCA15AK Models).....	14VDC
	(RCA15BK Models).....	28VDC
	(RCA15EK Models).....	10VDC to 30VDC
<u>STARTING CURRENT</u>	(RCA15AK Models).....	2.4 AMP MAX
	(RCA15BK Models).....	1.4 AMP MAX
	(RCA15EK Models).....	14VDC SYSTEM: 3.4 AMP MAX 28VDC SYSTEM: 1.4 AMP MAX
<u>RUNNING CURRENT</u>	(RCA15AK Models).....	1.21 AMP MAX
	(RCA15BK Models).....	0.62 AMP MAX
	(RCA15EK Models).....	14VDC SYSTEM: 1.21 AMP MAX 28VDC SYSTEM: 0.62 AMP MAX
<u>CIRCUIT BREAKER SIZE</u>	(RCA15AK Models).....	3 AMP
	(RCA15BK Models).....	2 AMP
	(RCA15EK Models).....	14VDC SYSTEM: 4 AMP 28VDC SYSTEM: 2 AMP
LIMITS		±85° PITCH AND ROLL
AZIMUTH INDICATION RANGE		360 DEGREES
OPERATING TEMPERATURE RANGE.....		-30° TO +70° C
DIMENSIONS		SEE FIGURE 1
PANEL CUTOUT.....		SEE FIGURE 1
FAA SPECIFICATION CONFORMANCE.....	MEETS OR EXCEEDS	TS0-C5c
AERONAUTICAL STANDARD.....	MEETS OR EXCEEDS	AS397

TABLE 1.1, Leading Particulars



**RCA15 SERIES
LIGHTED (TYPICAL)**

CONNECTOR:
Mates with MS3116E8-4S
or equivalent



**PANEL CUTOUT
REAR MOUNTING**

NOTE:

- All dimensions are in inches.
- **Screw length:** 0.38 plus bezel & panel thickness.
- **Pinout EK Multi-Volt:**

LIGHTED:

- A: Ground Motor
- B: Ground Lights
- C: +10-30VDC Motor
- D: +10-30VDC Lights

NON-LIGHTED:

- A: Ground Motor
- B: Spare
- C: +10-30VDC Motor
- D: Spare

- **Pinout AK 14-Volt:**

LIGHTED:

- A: Ground Motor
- B: +14VDC Motor
- C: Ground Lights
- D: +14VDC Lights

NON-LIGHTED:

- A: Ground Motor
- B: +14 VDC Motor
- C: Spare
- D: Spare

- **Pinout BK 28-Volt:**

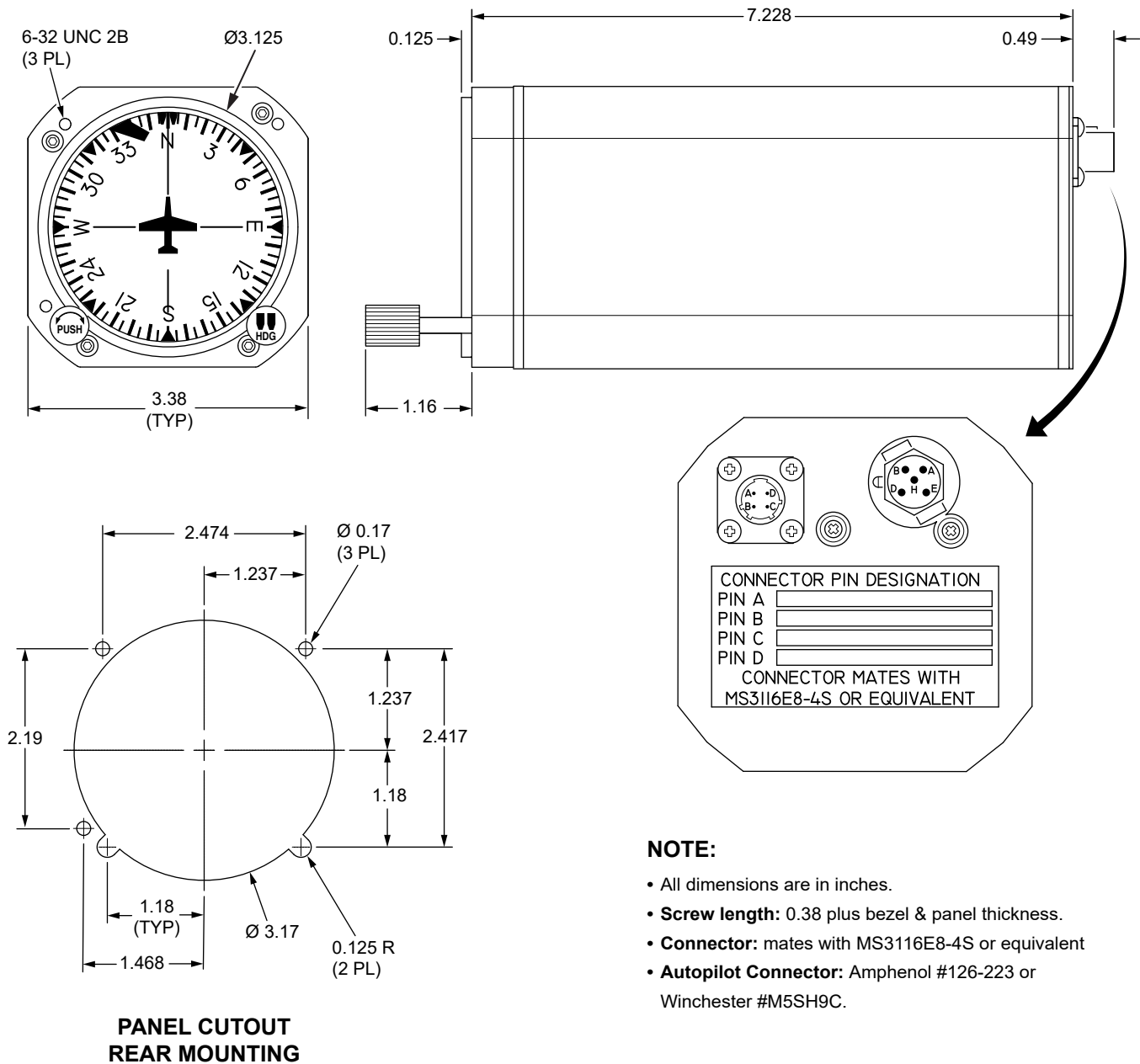
LIGHTED:

- A: Ground Motor
- B: Ground Lights
- C: +28VDC Motor
- D: +28VDC Lights

NON-LIGHTED:

- A: Spare
- B: Spare
- C: +28VDC Motor
- D: Ground Motor

Figure 1.1, General Dimensions (Typical)



**RCA15 SERIES
WITH AUTOPILOT (TYPICAL)**

Figure 1.2, General Dimensions Autopilot/Heading Bug (Typical)

1.3 DISPLAY FEATURES

See Figure 1.2 below for typical display features.

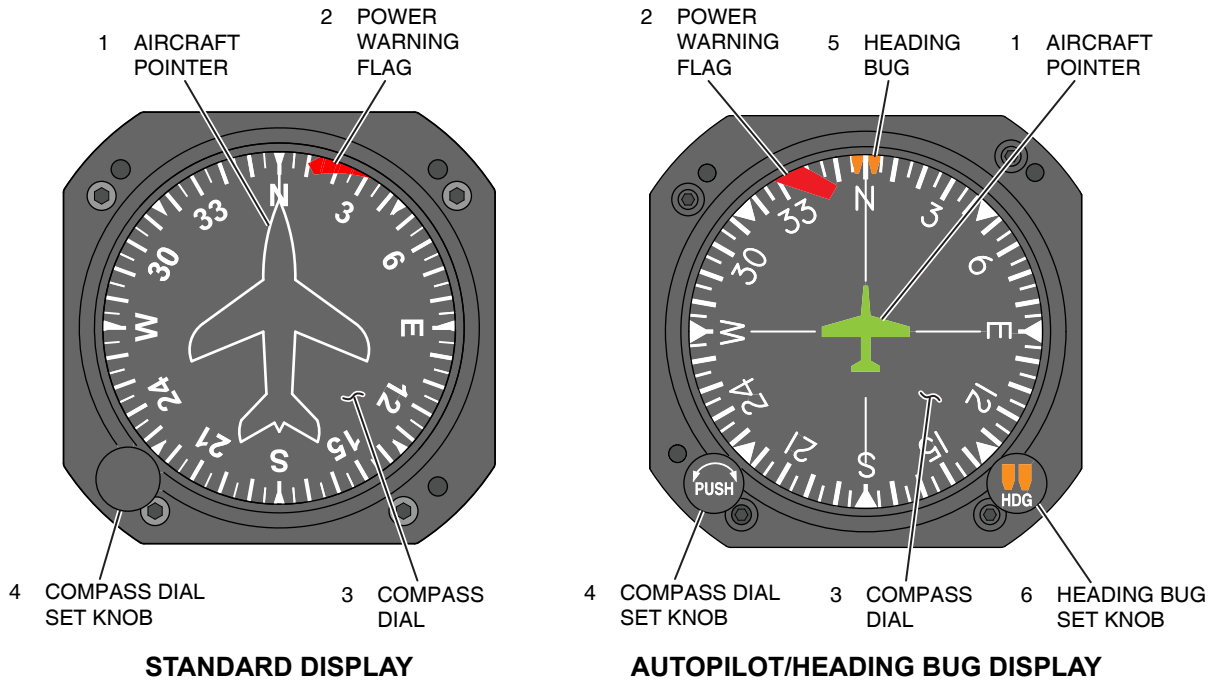


Figure 1.3, Typical Display Features

- 1. AIRCRAFT POINTER**
Represents the orientation of the aircraft's nose in relation to the compass heading.
- 2. POWER WARNING FLAG**
Will be visible when power is below the minimum to accurately operate the instrument.
- 3. COMPASS DIAL**
Adjusts the Symbolic Airplane to compensate for viewing parallax. Adjust Symbolic Airplane so that it is visually aligned with the horizon from pilot's normal sitting position.
- 4. COMPASS DIAL SET KNOB**
Adjusts the compass dial to align with the magnetic compass.
- 5. HEADING BUG**
Marks the desired heading on the Compass Dial.
- 6. HEADING BUG SET KNOB**
Moves the Heading Bug to the desired heading on the Compass Dial.

1.4 OPTIONS AND CONFIGURATIONS

For available options and configurations, refer to Table 1.2, below.

Lighting	Select models
Display pointer style	Standard style
Display pointer style (autopilot)	Cessna/Piper
Power Warning Flag	All models
Autopilot/Heading Bug	Select models

Table 1.2, Options and Configurations

SECTION 2, INSTALLATION

2.1 GENERAL INFORMATION

The conditions and tests required for the TSO approval of this article are minimum performance standards. It is the responsibility of those installing this article either on or within a specific type or class of aircraft to determine that the aircraft installation conditions are within the TSO standards. TSO articles must have a separate approval installation in an aircraft. Installation must only be performed under 14CFR Part 43 or the applicable airworthiness requirements.

2.2 HANDLING

-CAUTION-

Gyroscopic instruments are easily damaged by improper handling. Please follow all handling precautions to prevent damage to the gyro.

Gyros are very delicate instruments. Please observe the following precautions while handling.

1. A high gyroscope failure rate can be attributed to poor handling. Do not drop, jar or shake instrument. Store instrument in shipping container until installation. Avoid placing instrument on hard surfaces. Place on padded surface only.
2. Gyros should be transported in the original shipping container when moved to and from aircraft. If container is not available, carefully carry by hand in upright position.
3. Never move the instrument while the gyro is still spinning. Excessive movement while gyro is spinning may damage gimbal bearings.
4. To prevent further damage, a malfunctioning instrument should be handled as carefully as a new instrument. Most malfunctioning gyros can be repaired and returned to service. Contact Kelly Manufacturing Co. for repair information.

2.3 PRE-INSTALLATION INSPECTION

1. When instrument is first received, inspect container for any shipping damage.
2. Carefully remove instrument from shipping container and retain container for later storage or shipping.
3. Inspect instrument for any signs of damage. Contact your Shipper to file any claim due to shipping damage.

2.4 INSTALLATION

NOTE

Before installation, check labeling on the instrument to assure that the power voltage is correct for your aircraft.

Install the instrument on the aircraft by using the aircraft manufacturer's recommendations and by the following steps:

1. The **RCA15** Series Directional Gyro uses the standard 3 1/8 inch panel cutout. Refer to figure 1.1 and 1.2 "General Dimensions" for instrument and cutout dimensions.
2. With the aircraft on level surface, level the instrument using an "L" bubble level on the lip of the bezel at the bottom of the glass and adjust the instrument until the bubble is centered.
3. Secure instrument with user supplied screws. Use 6-32 UNC-2b screws or equivalent. Screw length should not exceed 0.38 inches plus bezel and panel thickness.
4. Attach harnesses as required. Connector pinout is as indicated on the instrument label.
5. Apply power to instrument. Observe that the lighting (if installed) is working properly.

SECTION 3, OPERATION

3.1 PRE-FLIGHT PROCEDURES

During pre-flight procedures, the directional gyro must be provided with adequate vacuum pressure under normal vibration conditions (engine running). Allow a minimum of three minutes for the gyro to gain operational speed.

Before flight, align the aircraft to a known compass heading and set the compass dial by pushing-in the Compass Dial Set Knob and turning either direction to match the compass dial to the aircraft pointer.

3.2 IN-FLIGHT PROCEDURES

You may adjust the Compass Dial and Heading Bug at any time.

3.3 FLIGHT LIMITATIONS

It is not recommended to perform aerobatic maneuvers while using the **RCA15** Series Directional Gyro. Extreme maneuvers will cause the instrument to show an error and will become unreliable as a reference to heading. Damage to the instrument may also occur under these conditions.

3.4 EMERGENCY PROCEDURES

In the event that the Power Flag comes into view, the accuracy of the instrument becomes unreliable until the flag moves back out of view. The Power Flag is actuated by the amount of voltage to the instrument and will display in the "off" position when less than minimum voltage is available to the instrument. A thorough check of the instrument power source is recommended if this situation should occur.

Frequently Asked Questions

How long should my gyro last?

There are many factors that determine the life of a gyro. We have seen gyros with everything from corrosion from sea air to excessive bearing wear from rough landings. Ideally you should receive hundreds of hours of use, but it is completely dependent on how the unit is treated and the environment in which it is used. If a gyro sits stationary for a long period of time, the bearings become unusable. The gyro should be run at least once a month to keep the bearings lubricated.

How do I get my instrument repaired?

For any overhaul or repair questions you can contact Kelly Manufacturing Company. Our Service Center can repair or refurbish any RC Allen instrument. The only thing really required is information. You can send us your instrument with a letter giving us your name, return shipping address, phone number and a brief description of what is wrong with the instrument. Email us for more information: SERVICE@KELLYMFG.COM.

For repair information, Contact:
Phone: (316)265-6868
Fax: (316)265-6687
Email: service@kellymfg.com

APPENDIX A

Instructions for Continued Airworthiness

Document Number: ICA19.003 Rev A

Equipment/Model Number: RCA15 series		
Equipment Description: Electric Directional Gyro Indicator		
1. Description		
This document describes the necessary maintenance requirements and instructions necessary to ensure the continued airworthiness of aircraft/rotorcraft with the RCA15 series Electric Directional Gyro Indicators installed.		
2. Operation		
Operating Instructions for the RCA15 series are detailed in the following document: <ul style="list-style-type: none"> ▪ Kelly Manufacturing Company Operation/Installation Guide (Publication No. 1407) 		
3. Equipment Certifications		
▪ FAA TSO-C5c	▪ AS397A	
3. Servicing		
No scheduled service required		
4. Maintenance Instructions		
Every 12 months:		
Check that the RCA15 Electric Directional Gyro Indicator is responding properly and operating within the guidelines detailed in Kelly Manufacturing Company Publication No. 1407. Also verify the following <ul style="list-style-type: none"> ▪ Power failure flag is pulled out of view when power is applied and drops down into view when power is shut off. ▪ 'Pull to Cage' knob operation is smooth and does not cause the unit to behave erratically after released 		
Every 24 months:		
Check functional indication accuracy		
Note: Indication accuracy can be verified in flight test using the following procedure: <ul style="list-style-type: none"> ▪ After take-off and before IFR situations perform two turns in opposite directions of at least 15 degrees. ▪ Return aircraft to level flight/cruising speeds for a minimum of 2 minutes. ▪ Verify the RCA15 indicates accurate heading within four degrees. 		
Service is required if the RCA15 does not pass this flight test. Instrument service can be performed at Kelly Manufacturing Company service@kellymfg.com		
Airworthiness Limitations		
There are no airworthiness limitations for the RCA15 series Reference section 3.3 of Kelly Manufacturing Company Publication 1407.		
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