

PROPRIETARY NOTICE
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REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED
A	SEE PREVIOUS REVISION REV A CHANGES	3/14/12	APPROVED: S. PHILIBEN
B	ADDED NOTES 7 & 8 FOR INCOMP TSO AND MAINTENANCE	8/6/2012	DRAWN: A. FACKRELL CHECKED: C. BABB APPROVED: S. PHILIBEN
C	ALL SHTS: CHANGED COMPANY ADDRESS SH 1: FIXED TYPOS	11/30/2012	DRAWN: A. FACKRELL CHECKED: RDK 12/3/12 APPROVED: RDK 12/3/12



NOTES:

- ENVIRONMENTAL QUALIFICATION PER RTCA/DO-160(F): REF CB-TR-2840-007 ENVIRONMENTAL SUMMARY.
 - A) 4.0 TEMPERATURE AND ALTITUDE, B2
 - B) 5.0 TEMPERATURE VARIATION, B
 - C) 6.0 HUMIDITY, B
 - D) 7.0 OPERATIONAL SHOCKS, A
 - E) 8.0 VIBRATION, S (M)
 - F) 9.0 EXPLOSIVE ATMOSPHERE, E1,2
 - G) 15.0 MAGNETIC EFFECT, Z
 - H) 16.0 POWER INPUT, B
 - I) 17.0 VOLTAGE SPIKE, B
 - J) 18.0 AUDIO FREQUENCY SUSCEPTIBILITY, B
 - K) 19.0 INDUCED SIGNAL SUSCEPTIBILITY, ZC
 - L) 21.0 EMISSION OF RADIO FREQUENCY ENERGY, L
 - M) 25.0 ELECTROSTATIC DISCHARGE, A
- COMPLEX HARDWARE QUALIFICATIONS PER RTCA/DO-254 LEVEL D. REF PHAC CB-TR-2840-001.
- SCREWS AND WASHERS ARE NOT SUPPLIED WITH UNIT. TORQUE SCREWS 18 - 22 IN. LB. USING CROSSING PATTERN. OVER TORQUING MAY CAUSE DAMAGE TO GASKET OR SENDER.
- ALL CONNECTOR VIEWS ARE SHOWN AS VIEWED FROM MATING CONNECTOR.
- POWER REQUIREMENTS:
 - A) 8.0 - 14.4 VDC
 - B) 60 mA PER SENSOR (NOMINAL STEADY-STATE)
 - C) TYPICAL IN-RUSH: 500 mA DECAYING TO STEADY-STATE 60 mA AFTER 750 MICROSECONDS FOR EACH SENSOR.
- ACCURATE TO 0.71° SEE SHEET 5.
- THE INCOMPLETE (INCOMP) TSO ARTICLE MEETS THE FOLLOWING MINIMUM OPERATION PERFORMANCE STANDARD REQUIREMENTS (MOPS) FOR TSO C55a

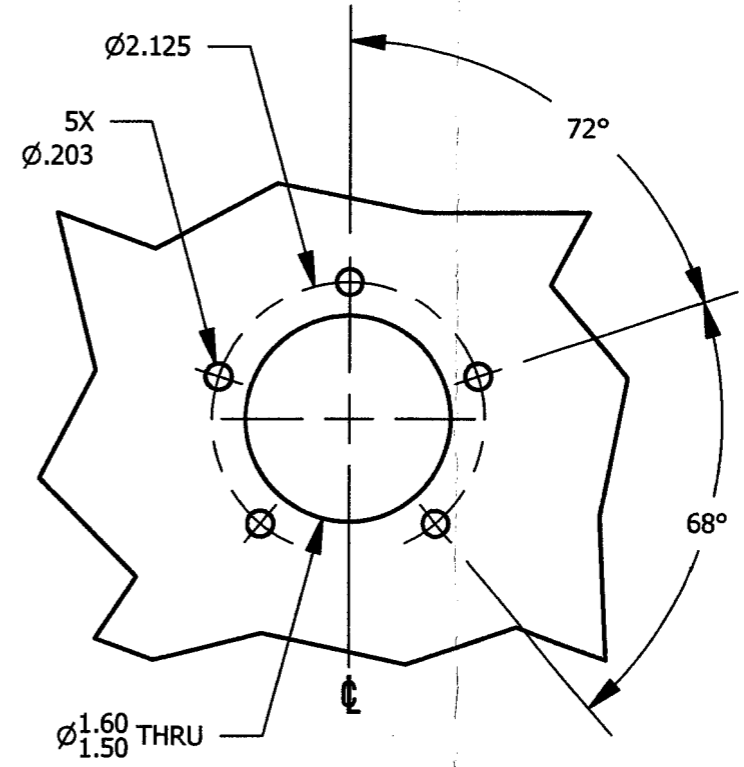
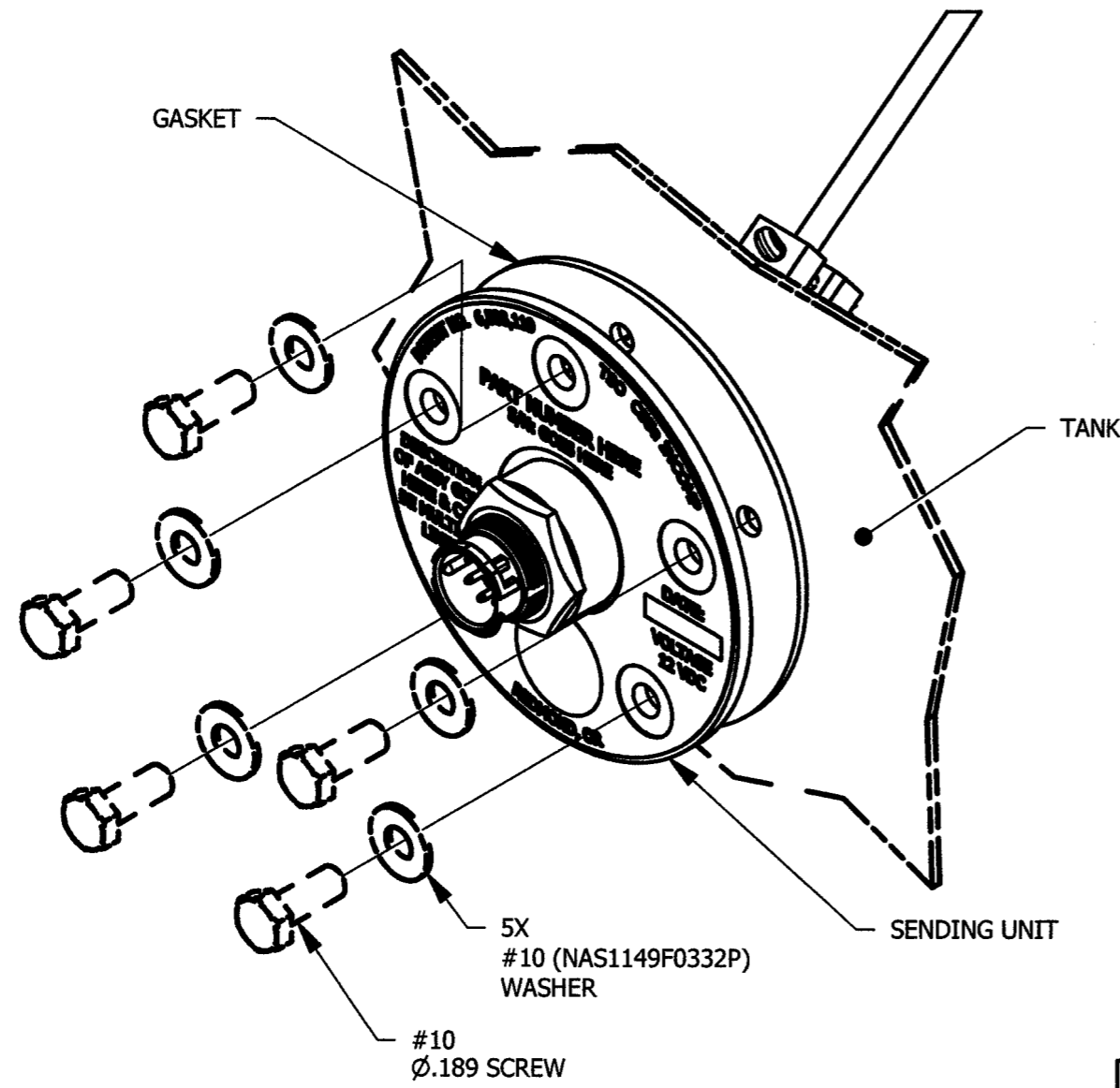
- A) SAE AS405c
 - 3.1.1 MATERIALS
 - 3.1.2 WORKMANSHIP
 - 3.2 IDENTIFICATION
 - 3.3.1 TEMPERATURE
 - 3.3.2 HUMIDITY
 - 3.3.3 VIBRATION
 - 3.3.4 ALTITUDE
 - 3.3.5 FIRE HAZARD
 - 3.3.6 SEAL
 - 3.4 RADIO INTERFERENCE
 - 3.5 MAGNETIC EFFECT
 - 4.3 POWER VARIATION
 - 4.4 POWER INDICATION
 - 4.5 TANK MOVING PARTS
 - 4.6 FILLING MEDIUM
 - 5.1 ATMOSPHERIC CONDITIONS
 - 5.2 VIBRATION
 - 5.3 VIBRATION EQUIPMENT
 - 5.3.1 LINEAR MOTION VIBRATION
 - 5.3.2 CIRCULAR MOTION VIBRATION
 - 5.4 POWER CONDITIONS
 - 5.5 POSITION
 - 5.6 TEST LIQUID
 - 6.1 SCALE ERROR
 - 6.2 FRICTION
 - 6.3 LEAK TEST
 - 6.4 POSITION ERROR
 - 6.5 POWER VARIATION
 - 6.6 DIELECTRIC
 - 6.7 MAXIMUM OPERATING TEMP
 - 7.0 QUALIFICATION TESTS
 - 7.1.1 LOW TEMPERATURE
 - 7.1.2 HIGH ALTITUDE - LOW TEMP
 - 7.3 VIBRATION
 - 7.3.1 RESONANCE
 - 7.3.2 CYCLING
 - 7.4 HUMIDITY
 - 7.5 MAGNETIC EFFECT
 - 7.6 SEALING

NOTES CONTINUED:

- B) TSO C55a
DO-254 ELECTRONIC HARDWARE QUALIFICATION
- C) TSO C55a ADDITIONS
 - A) PARAGRAPH 7.7
 - B) PARAGRAPH 7.8
 - C) PARAGRAPH 7.9
 - D) PARAGRAPH 7.10
 - E) PARAGRAPH 7.11
 - F) PARAGRAPH 7.12
 - I) PARAGRAPH 7.13
 - J) PARAGRAPH 7.14
 - K) PARAGRAPH 7.15
 - L) PARAGRAPH 7.16
 - M) PARAGRAPH 7.17
 - N) PARAGRAPH 7.18
- 8) MAINTENANCE REQUIREMENTS
 - A) THE TSO SENDER WILL INDICATE INTERNAL FAILURE WITH A SHORT LOW FREQUENCY OUTPUT 16 HZ FOR 200 MS. THE FUEL LEVEL SENDER UNITS ARE NOT REPAIRABLE - REPLACE ON CONDITION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: DECIMALS ANGLES .X±.10 .5° .XX±.03 ±.5° .XXX±.010	CONTRACT NO.	 221 SE TIMBER AVE REDMOND, OR 97756	
	APPROVALS		
DO NOT SCALE DRAWING	DRAWN R. KIRKNESS	11/2/2011	INSTALLATION SPECIFICATION
THIRD ANGLE PROJECTION	CHECKED S. PHILIBEN	11/4/2011	
	ENGINEER S. PHILIBEN	11/4/2011	
	APPROVED S. PHILIBEN	11/4/2011	
SCALE		SIZE	CAGE CODE B 66YY1
		DWG NO.	CB2840990010
		REV.	C
		APPROVED DEC 03 2012 SHEET 1 OF 5	

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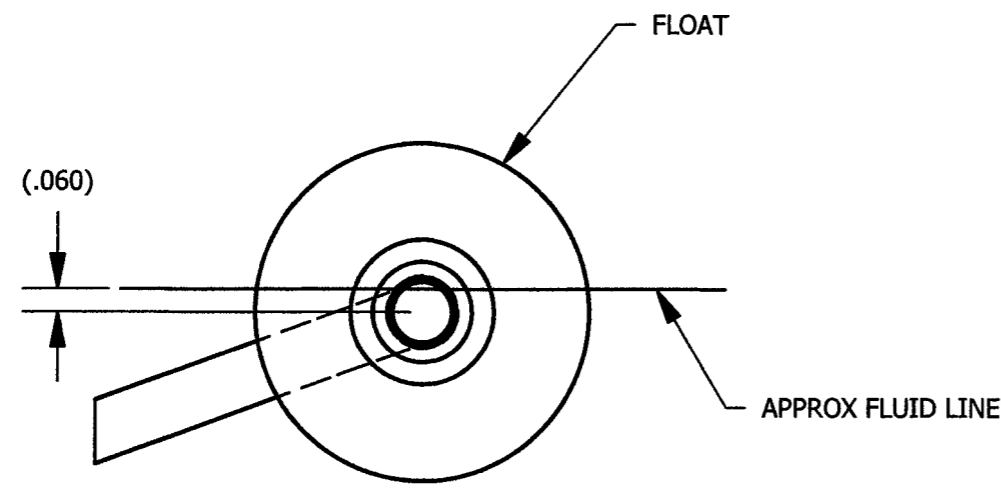
SAE 5 HOLE PATTERN
INSTALLATION OUTLINE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: DECIMALS ANGLES X±.10 ±.5 XX±.03 .XXX±.010 DO NOT SCALE DRAWING THIRD ANGLE PROJECTION 	CONTRACT NO.		221 SE TIMBER AVE REDMOND, OR 97756
	APPROVALS	DATE	
	DRAWN R. KIRKNESS	11/2/2011	TITLE INSTALLATION SPECIFICATION
	CHECKED S. PHILBEN	11/4/2011	
ENGINEER S. PHILBEN	11/4/2011		
APPROVED S. PHILBEN	11/4/2011	SIZE CAGE CODE DWG NO. REV. B 66YY1 CB2840990010 C	
SCALE NONE			APPROVED DEC 03 2012 SHEET 2 OF 5

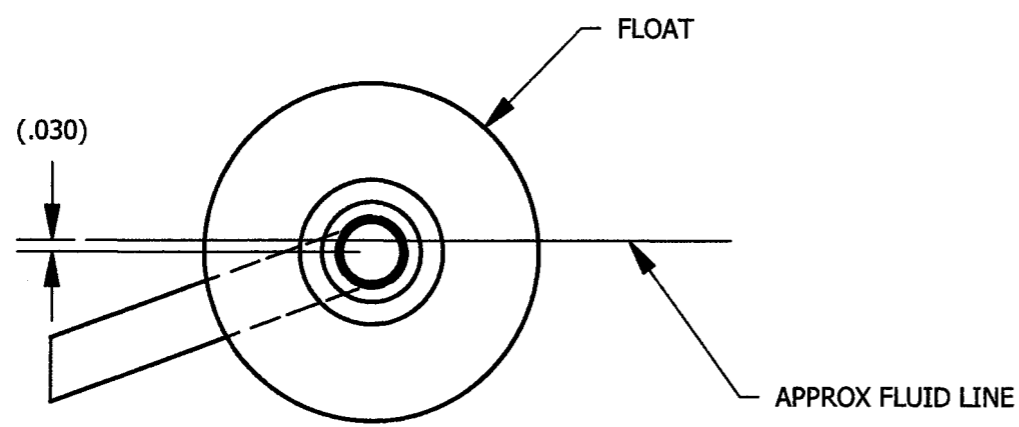
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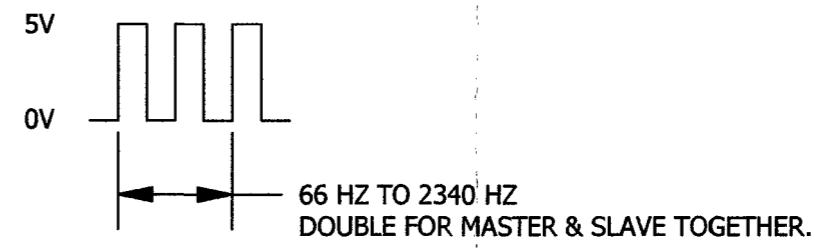


AVGAS
PER ASTM D910 (100LL)

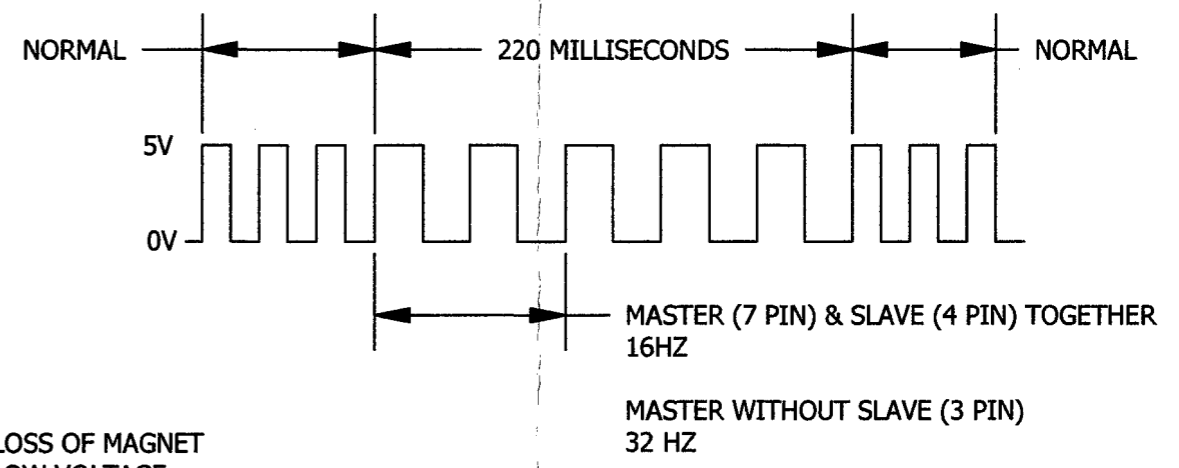


IPS FLUID
PER DTD406B (AL-5)

NORMAL CONDITION



ERROR CONDITION



ERROR CONDITIONS: LOSS OF MAGNET
LOW VOLTAGE
PARITY ERROR

CIES INC		221 SE TIMBER AVE REDMOND, OR 97756	
TITLE INSTALLATION SPECIFICATION			
SIZE B	CAGE CODE 66YY1	DWG NO. CB2840990010	REV. C
SCALE NONE		APPROVED DEC 03 2012	SHEET 3 OF 5

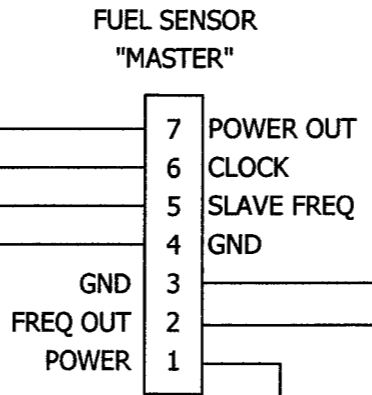
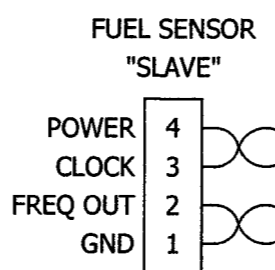
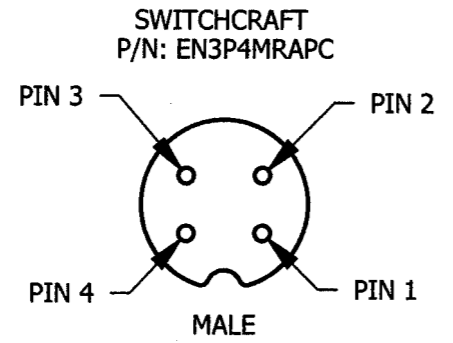
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2

1

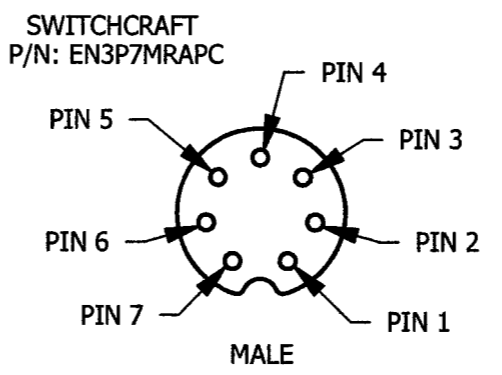
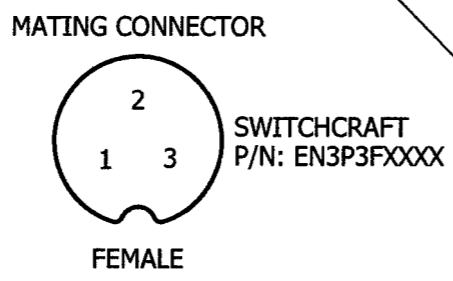
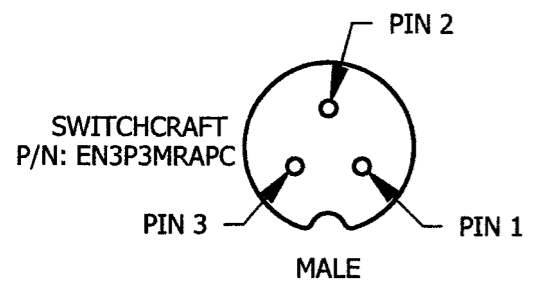
FUEL LEVEL SENSOR SYSTEM



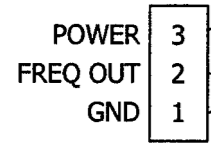
8 - 14.4V

FREQ OUT

IPS LEVEL SENSOR SYSTEM



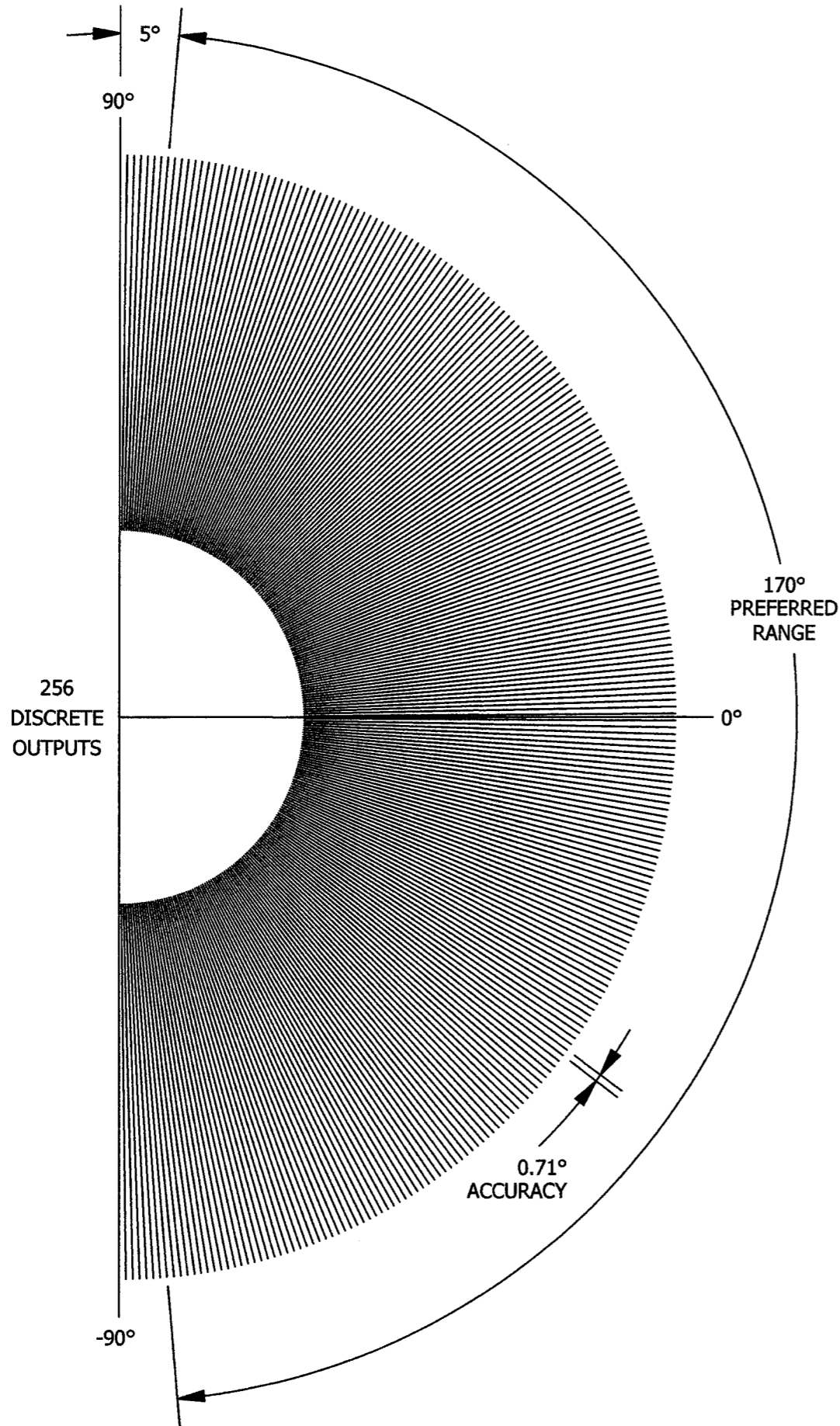
IPS SENSOR



8 - 14.4V

FREQ OUT

		221 SE TIMBER AVE REDMOND, OR 97756	
TITLE INSTALLATION SPECIFICATION			
SIZE B	CAGE CODE 66YY1	DWG NO. CB2840990010	REV. C
SCALE NONE		APPROVED DEC 03 2017	SHEET 4 OF 5



NOTE:

EACH LINE IN DIAGRAM REPRESENTS A DISCRETE OUTPUT IN HERTZ. FOR CHART SHOWING OUTPUTS CONTACT CIES.

EQUATIONS ARE AS FOLLOWS:

F = HZ
 Θ = ANGLE

$$F_{\text{master}}(\Theta) = 3E-09\Theta^6 - 1E-06\Theta^5 + 0.0003\Theta^4 - 0.0227\Theta^3 + 1.0167\Theta^2 - 20.369\Theta + 208.65$$

$$F_{\text{slave}}(\Theta) = 6E-09\Theta^6 - 3E-06\Theta^5 + 0.0005\Theta^4 - 0.0454\Theta^3 + 2.0333\Theta^2 - 40.737\Theta + 417.29$$

FOR ASSEMBLIES WITH A MASTER AND SLAVE COMBINATION THE HERTZ OUTPUT IS DETERMINED BY:

$$\frac{1}{(1/\text{MASTER FREQUENCY}) + (2/\text{SLAVE FREQUENCY})}$$

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SCALE NONE		APPROVED DEC 03 2012 SHEET 5 OF 5	