REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
00	RELEASE PER ECO 03-188	7/22/03	
01	REVISE PER ECO 03-239	9/19/03	
02	REVISE PER ECO 03-263	10/31/03	

SENSOR INPUT INFORMATION

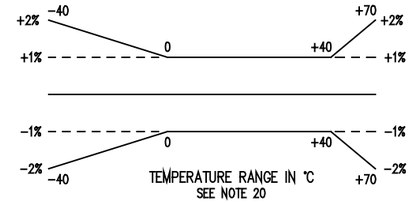
PARAMETER	RANGE / UNIT	FACTOR	CALIBRATION DATA								TOLERANCE OVER ENTIRE RANGE		SENSOR INFORMATION	PARALLEL INSTRUMENTS
											NORMAL TEMP	EXTREME TEMP		
MAP	0.0 TO 36.0 IN-HG	VDC/IN-HG	0.500 / 0.0	0.827/ 5.0	1.155/ 10.0	1.482/ 15.0	1.810/ 20.0	2.137/ 25.0	2.465/ 30.0	2.857/ 36.0	+/- 0.3 IN -HG	+/- 0.7 IN -HG	KAVLICO P/N P165-30A-E1A	MID - CONTINENT P/N MD160-3
RPM	0 TO 3500 RPM	HZ / RPM	0 / 0	12.5 / 500	25.0 / 1000	37.5 / 1500	50.0 / 2000	62.5 / 2500	75.0 / 3000	87.5 / 3500	+/- 35 RPM	+/- 70 RPM	PENNY & GILES 1.5 PPR	MID - CONTINENT P/N MD165-1
EGT (6 CH)	500 TO 1650 F	MV / F CJ = ICE POINT	10.561 / 500	26. 978 / 1200	29.315 / 1300	31.628 / 1400	33.912 / 1500	36.166 / 1600	37.281 / 1650		+/- 16 F	+/- 33 F	WATLOW P/N AF1136601 K - TYPE THERMOCOUPLE	MID - CONTINENT P/N MD161-1
FUEL FLOW	0.0 TO 30.0 GPH	HZ / GPH	0.00 / 0.0	40.83 / 5.0	81.67 / 10.0	122.50 / 15.0	163.33 / 20.0	204.17 / 25.0	245.00 / 30.0		+/- 0.3 GPH	+/- 0.6 GPH	SHADIN P/N 680501L K - FACTOR 29,400 PPG	N/A
CHT (6 CH)	100 TO 500 F	OHMS / F	114.69 / 100	125.35 / 150	135.85 / 200	146.44 / 250	167.00 / 350	177.33 / 400	187.56 / 450	197.71 / 500	+/- 5 F	+/- 10 F	WATLOW P/N RF1035401 OUTPUT PER DIN - IEC-751 PLATINUM RTD	N/A
OP	0 TO 100 PSI	VDC / PSI	0 .5 / 0	0.70 / 5	0.90 / 10	1.30 / 20	2.10 / 40	2.90 / 60	3.70 / 80	4.50 / 100	+/- 1 PSI	+/- 2 PSI	KAVLICO P/N P155-100G-E1A	MID - CONTINENT P/N MD162-3
OT	0 TO 250 F	MV / F	67.6 / 0	72.0 / 30	81.3 / 90	91.5 / 150	102.5 / 210	110.3 / 250			+/- 2.5 F	+/- 5 F	NORWICH P/N 102-00000 (MS28034-1) OUTPUT PER MIL-T-7990B	MID - CONTINENT P/N MD162-3
AMPS (ALT-1)	0 TO 100 AMPS	MV / AMPS	0.00 / 0	3.33 / 10	6.66 / 20	10.00 / 30	13.33 / 40	20.00 / 60	26.67 / 80	33.33 / 100	+/- 1 AMP	+/- 2 AMP	SHUNT P/N MS91586-7 50 MV OUTPUT FOR 150 AMPS	MID - CONTINENT P/N MD158
AMPS (ALT-2)	0 TO 100 AMPS	MV / AMPS	0.00 / 0	3.33 / 10	6.66 / 20	10.00 / 30	13.33 / 40	20.00 / 60	26.67 / 80	33.33 / 100	+/- 1 AMP	+/- 2 AMP	SHUNT P/N MS91586-7 50 MV OUTPUT FOR 150 AMPS	MID - CONTINENT P/N MD158
AMPS (BAT)	-100 TO 100 AMPS	MV / AMPS	-33.33 / -100	-26.67 / -80	-13.33 / -40	0.00 / 0	13.33 / 40	20.00 / 60	26.67 / 80	33.33 / 100	+/- 2 AMPS	+/- 4 AMPS	SHUNT P/N MS91586-7 50 MV OUTPUT FOR 150 AMPS	MID - CONTINENT P/N MD158
VDC (MAIN)	0.0 TO 36.0 VDC	VDC / VDC	0.00 / 0.0	10.00 / 10.0	15.00 / 15.0	20.00 / 20.0	25.00 / 25.0	28.00 / 28.0	36.00 / 36.0		+/- 0.4 VDC	+/- 0.7 VDC	AIRCRAFT BUS	N/A
VDC (ESS)	0.0 TO 36.0 VDC	VDC / VDC	0.00 / 0.0	10.00 / 10.0	15.00 / 15.0	20.00 / 20.0	25.00 / 25.0	28.00 / 28.0	36.00 / 36.0		+/- 0.4 VDC	+/- 0.7 VDC	AIRCRAFT BUS	N/A
OAT	-40 TO 60 C	OHMS / C	77.39 /-40	83.77 /-20	90.38 / 0	97.31 / 20	104.60 / 40	112.28 / 60			+/- 1 C	+/- 2 C	NORWICH P/N 102-00002 (MS28034-3) OUTPUT PER MIL-T-7990B	N/A

RS232 DATA FORMAT		
HEADER NAME	RESOLUTION	PARAMETER
AC (SEE NOTE 1)	NA	AIRCRAFT TYPE
E1	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN F, CYLINDER 1
E2	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN F, CYLINDER 2
E3	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN F, CYLINDER 3
E4	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN F, CYLINDER 4
E5	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN F, CYLINDER 5
E6	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN F, CYLINDER 6
C1	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN F, CYLINDER 1
C2	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN F, CYLINDER 2
C3	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN F, CYLINDER 3
C4	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN F, CYLINDER 4
C5	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN F, CYLINDER 5
C6	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN F, CYLINDER 6
OILT	1 DEGREE	OIL TEMPERATURE IN F
OILP	1 PSI	OIL PRESSURE
RPM	10 RPM	TACHOMETER
OAT	1 DEGREE	OUTSIDE AIR TEMPERATURE IN C
MAP	0.1 IN-HG	MANIFOLD PRESSURE
FF	0.1 GPH	FUEL FLOW
USED	0.1 GALLON	FUEL USED (CALCULATED)
AMP1	1 AMP	ALTERNATOR 1 CURRENT SENSE
AMP2	1 AMP	ALTERNATOR 2 CURRENT SENSE
AMPB	1 AMP	BATTERY CURRENT SENSE
MBUS	0.1 VDC	MAIN BUS VOLTAGE
EBUS	0.1 VDC	ESSENTIAL BUS VOLTAGE

RS232 INTERFACE NOTES:

1. AIRCRAFT TYPE DESIGNATOR IS 5.
2. HEADER EXAMPLE: "AC","E1","E2","E3","E4","E5","E6","C1","C2","C3","C4","C5","C6","OILT", "OILP","RPM","OAT","MAP","FF","USED","AMP1","AMP2","AMPB","MBUS","EBUS",<checksum><cr><lf>
3. DATA EXAMPLE: 5,1290,1300,1350,1260,1410,1390,385,320,352,384,330,355,192,80,2250,40 21.6,12.0,23.8,10,11,-1,22.6,22.0,5094<cr><lf>
4. ONE RS232 INTERFACE SHALL BE UTILIZED BY THE SENSOR INTERFACE UNIT.
5. THE RS232 TRANSMISSION OF THE DATA FROM THE SENSOR INTERFACE UNIT TO THE MULTI-FUNCTION DISPLAY SHALL BE 5 HZ.
6. THE RS232 INTERFACE SHALL BE CAPABLE OF OPERATING UP TO 9600 BPS, NO PARITY, 8 BITS, 1 STOP BIT.
7. THE DATA OUTPUT SHALL BE ASCII, COMMA DELIMITED TEXT.
8. THE OUTPUT SHALL TRANSMIT AN ASCII HEADER EVERY 15 TRANSMISSIONS.
9. A 16-BIT ADDITIVE CHECKSUM SHALL BE USED FOR SERIAL TRANSMISSION ERROR CHECKING FOR EACH TRANSMISSION (4 DIGIT HEX).
10. THE MINIMUM SAMPLING RATE OF SENSOR DATA SHALL BE 2 SECONDS.
11. THE SENSOR INTERFACE UNIT AND THE EXISTING PRIMARY INSTRUMENTATION SHALL HAVE EQUIVALENT VALUES WITHIN 5%.

SENSOR INTERFACE UNIT TOLERANCE



SPECIFICATION CONTROL DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± 1/32 DECIMALS .X ±.02 .XX ±.01 .XXX ±.005 ANGLES ± .5°

MATERIALS

FINISH

DO NOT SCALE DRAWING

AVIDYNE CORPORATION PROPRIETARY INFORMATION

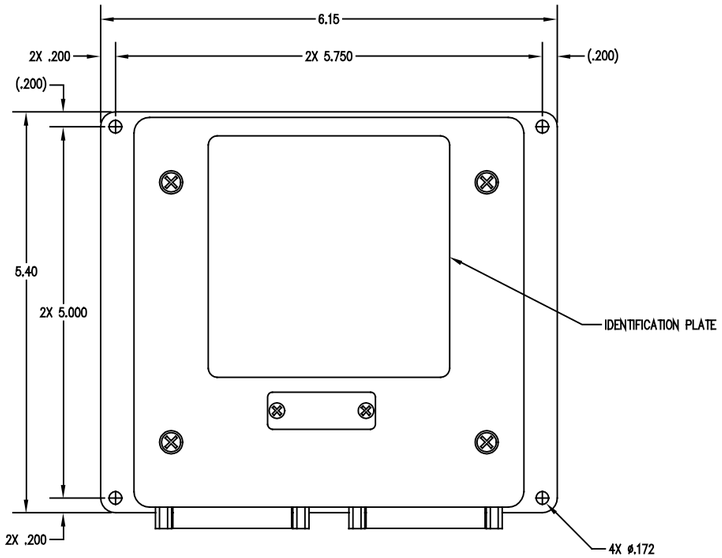
APPROVALS	DATE
DRAWN BY L. WRIGHTSON	7/16/03
CHECKED M. COLALILLO	7/16/03

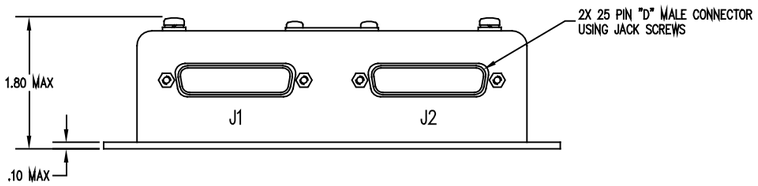
AVIDYNE CORPORATION
55 Old Bedford Road
Lincoln, MA 01773

ENGINE INSTRUMENTS, LANCAIR COLUMBIA 350

SIZE	DWG. NO.	REV.
D	200-00039-000	02

SCALE | SHEET 1 OF 2





DO-160D ENVIRONMENTAL QUALIFICATION TESTS		
ENVIRONMENTAL TESTS	RTCA/DO-160D SECTION	CONDUCTED TEST CATEGORY
TEMPERATURE AND ALTITUDE		
LOW TEMPERATURE	4.5.1	EQUIPMENT TO BE TESTED TO CATEGORY B1
HIGH TEMPERATURE	4.5.2 AND 4.5.3	EQUIPMENT TO BE TESTED TO CATEGORY B1
IN-FLIGHT LOSS OF COOLING	4.5.4	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
ALTITUDE	4.6.1	EQUIPMENT TO BE TESTED TO CATEGORY B1
DECOMPRESSION	4.6.2	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
COMPRESSION	4.6.3	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
TEMPERATURE VARIATION	5	EQUIPMENT TO BE TESTED TO CATEGORY B
HUMIDITY	6	EQUIPMENT TO BE TESTED TO CATEGORY A
OPERATIONAL SHOCKS AND CRASH SAFETY	7	EQUIPMENT TO BE TESTED TO CATEGORY B
VIBRATION	8	EQUIPMENT TO BE TESTED TO CATEGORY S, CURVE W
EXPLOSIVE PROOFNESS	9	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
WATER PROOFNESS	10	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
FLUIDS SUSCEPTABILITY	11	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
SAND AND DUST	12	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
FUNGUS RESISTANCE	13	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
SALT SPRAY	14	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
MAGNETIC EFFECTS	15	EQUIPMENT CLASS IS A
POWER INPUT	16	EQUIPMENT TO BE TESTED TO CATEGORY B
VOLTAGE SPIKE	17	EQUIPMENT TO BE TESTED TO CATEGORY B
AUDIO FREQUENCY CONDUCTED SUSCEPTABILITY	18	EQUIPMENT TO BE TESTED TO CATEGORY B
INDUCED SIGNAL SUSCEPTABILITY	19	EQUIPMENT TO BE TESTED TO CATEGORY A
RADIO FREQUENCY SUSCEPTABILITY	20	EQUIPMENT TO BE TESTED TO CATEGORY W
EMISSION OF RADIO FREQUENCY ENERGY	21	EQUIPMENT TO BE TESTED TO CATEGORY M
LIGHTNING INDUCED TRANSIENT SUSCEPTIBILITY	22	EQUIPMENT TO BE TESTED TO CATEGORY A3E3
LIGHTNING DIRECT EFFECTS	23	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
ICING	24	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
ELECTRO STATIC DISCHARGE	25	EQUIPMENT IDENTIFIED AS CATEGORY A

J1 PIN CONNECTIONS

1) +28VDC POWER INPUT HIGH (CHANNEL A)
2) POWER INPUT RETURN (CHANNEL A)
3) MAP SIGNAL INPUT HIGH
4) MAP SIGNAL INPUT RETURN
5) AMP ALTERNATOR 2 SIGNAL INPUT HIGH
6) AMP ALTERNATOR 2 SIGNAL INPUT LOW
7) AMP BATTERY SIGNAL INPUT HIGH
8) AMP BATTERY SIGNAL INPUT LOW
9) SPARE – NO CONNECTION
10) OIL TEMPERATURE SIGNAL INPUT HIGH
11) FUEL FLOW SIGNAL INPUT HIGH
12) FUEL FLOW SIGNAL INPUT RETURN
13) SPARE – NO CONNECTION
14) EGT CYLINDER 6 SIGNAL INPUT – ALUMEL, RED (–)
15) EGT CYLINDER 6 SIGNAL INPUT – CHROMEL, YELLOW (+)
16) EGT CYLINDER 5 SIGNAL INPUT – ALUMEL, RED (–)
17) EGT CYLINDER 5 SIGNAL INPUT – CHROMEL, YELLOW (+)
18) EGT CYLINDER 4 SIGNAL INPUT – ALUMEL, RED (–)
19) EGT CYLINDER 4 SIGNAL INPUT – CHROMEL, YELLOW (+)
20) EGT CYLINDER 3 SIGNAL INPUT – ALUMEL, RED (–)
21) EGT CYLINDER 3 SIGNAL INPUT – CHROMEL, YELLOW (+)
22) EGT CYLINDER 2 SIGNAL INPUT – ALUMEL, RED (–)
23) EGT CYLINDER 2 SIGNAL INPUT – CHROMEL, YELLOW (+)
24) EGT CYLINDER 1 SIGNAL INPUT – ALUMEL, RED (–)
25) EGT CYLINDER 1 SIGNAL INPUT – CHROMEL, YELLOW (+)

J2 PIN CONNECTIONS

1) +28VDC POWER INPUT HIGH (CHANNEL B)
2) CHT (ALL) AND POWER INPUT RETURN (CHANNEL B)
3) CHT CYLINDER 1 SIGNAL INPUT HIGH
4) CHT CYLINDER 2 SIGNAL INPUT HIGH
5) CHT CYLINDER 3 SIGNAL INPUT HIGH
6) CHT CYLINDER 4 SIGNAL INPUT HIGH
7) CHT CYLINDER 5 SIGNAL INPUT HIGH
8) CHT CYLINDER 6 SIGNAL INPUT HIGH
9) VDC MAIN BUS SIGNAL INPUT HIGH
10) RS232 GROUND
11) RS232 TRANSMIT
12) RS232 RECEIVE
13) RS232 SHIELD
14) OIL PRESSURE SIGNAL INPUT HIGH
15) OIL PRESSURE SIGNAL RETURN
16) AMP ALTERNATOR 1 SIGNAL INPUT HIGH
17) AMP ALTERNATOR 1 SIGNAL INPUT LOW
18) VDC ESSENTIAL BUS INPUT HIGH
19) OAT SIGNAL INPUT HIGH
20) OAT SIGNAL INPUT RETURN
21) PROP RPM SIGNAL INPUT HIGH
22) PROP RPM SIGNAL INPUT RETURN
23) SPARE – NO CONNECTION
24) SPARE – NO CONNECTION
25) SPARE – NO CONNECTION

NOTES:

1. SENSOR INTERFACE UNIT PART NUMBER IS A1185, Rev A MOD 1.
2. WEIGHT: 1.40 LBS. MAX.
3. POWER INPUT: 10 TO 33 VDC.
4. POWER CONSUMPTION: 3.5 WATTS MAX.
5. STORAGE TEMPERATURE RANGE: –55 °C TO +85 °C
6. OPERATING TEMPERATURE RANGE: –40 °C TO + 70 °C.
7. OPERATING ALTITUDE RANGE: 25,000 FEET ABOVE SEA LEVEL.
8. THE SENSOR INTERFACE UNIT COMPLIES TO DO-160D AS LISTED IN THE TABLE.
9. THE SENSOR INTERFACE UNIT COMPLIES WITH DO-178B, LEVEL D.
10. FOR PROPER OPERATION, THE SENSOR INTERFACE UNIT MUST BE CONNECTED IN PARALLEL WITH THE EXISTING PRIMARY INSTRUMENTATION.
11. THE SIGNAL INPUTS TO THE SIGNAL INTERFACE UNIT FROM THE OIL TEMPERATURE SENSOR (SUPPLIED WITH THE ENGINE) BECOME A VOLTAGE TYPE INPUT AFTER THE CONNECTIONS ARE MADE IN PARALLEL WITH THE EXISTING PRIMARY INSTRUMENTATION.
12. THE SENSOR INTERFACE UNIT MAINTAINS ITS CONFIGURATION AND CALIBRATION DATA WHEN POWERED OFF.
13. RS232 DATA FORMAT IS AS LISTED IN THE TABLE ON SHEET 2.
14. ALL SIGNAL INPUTS ARE IN PARALLEL WITH THE EXISTING AIRCRAFT INSTRUMENTS, EXCEPT EGT (6 CHANNELS), CHT (6 CHANNELS), FF AND OAT.
15. TO MEET EMI PROTECTION REQUIREMENTS OF DO-160D, ALL SIGNAL INPUT AND OUTPUT LINES MUST BE SHIELDED, WITH THE SHIELD GROUNDED AT THE SIU CONNECTOR SIDE.
17. FOR ACCEPTANCE TEST REPORT, SEE F-140.
18. FOR FINAL ASSEMBLY, SEE A843-2.
19. THE CURRENT SHUNTS FOR ALT1. ALT2 AND BATTERY AMP PARAMETERS ARE LOCATED IN THE HIGH SIDE OF EACH LINE WITH THE COMMON MODE VOLTAGE OF 14 VOLTS.
20. TOLERANCE IS BASED ON ±1% OF FULL SCALE VALUE OR ONE COUNT, WHICHEVER IS GREATER, FROM 0 TO 40 °C AND 2% OR TWO COUNTS, WHICHEVER IS GREATER, FROM 0 TO –40 °C AND +40 TO +70 °C.
21. AVIDYNE PART NUMBER IS 200-00039-000.
22. ALL CHT RETURNS SHOULD COME DIRECTLY FROM THE SENSORS AND CONNECT TO J2-2.

(A) 23. MOD 1 BOX ON IDENTIFICATION PLATE TO BE CHECKED FOR REV "A" CONFIGURATION.

SPECIFICATION CONTROL DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± 1/32 DECIMALS .X ±.02 .XX ±.01 .XXX ±.005 ANGLES ± .5°
MATERIALS
FINISH
DO NOT SCALE DRAWING

AVIDYNE CORPORATION
PROPRIETARY INFORMATION

APPROVALS	DATE
DRAWN BY L. WRIGHTSON	7/16/03
CHECKED M. COLALILLO	7/16/03

AVIDYNE CORPORATION
55 Old Bedford Road
Lincoln, MA 01773

ENGINE INSTRUMENTS
LANCAIR COLUMBIA 350

SIZE D | DWG. NO. 200-00039-000 | REV. 02

SCALE | SHEET 2 OF 2