 <b>TELEDYNE ELECTRONIC TECHNOLOGIES</b> Analytical Instruments	<h1 style="text-align: center;">TEST PROCEDURE</h1>	<b>SENSOR DEPARTMENT TEST PROCEDURE</b>
<b>MODEL NUMBER:</b>  T7 OXYGEN SENSOR	<b>PROCEDURE NUMBER:</b>  TP-51327	PAGE: 1 OF 4 REV.: 5    REV. DATE: 1/13/97 ECO #: 97-0026


**TELEDYNE  
ANALYTICAL INSTRUMENTS**  

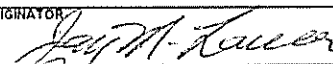
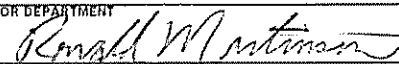
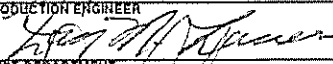

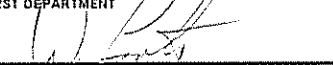
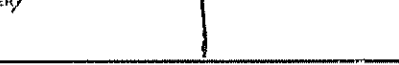
**07/07/20**

**DOCUMENT CONTROL  
COPY**

**Use and Disclosure of Data**  
 Information contained herein is classified as EAR99 under the  
 U.S. Export Administration Regulations.  
 Export, reexport or diversion contrary to U.S. law is prohibited.

## WARNING

TESTING OF THIS INSTRUMENT MAY INVOLVE ELECTROSTATIC SENSITIVE DEVICES (ESD), HIGH VOLTAGE, HAZARDOUS GASES, AND/OR CHEMICAL. PERSONNEL WHO ARE NOT FAMILIAR WITH PROCEDURES FOR THE ABOVE MUST CHECK WITH THEIR SUPERVISOR PRIOR TO BEGINNING THE TEST.

CONCURRENCE	DATE	CONCURRENCE	DATE
<small>ORIGINATOR</small> 		<small>SENSOR DEPARTMENT</small> 	
<small>PRODUCTION ENGINEER</small> 		<small>QUALITY ASSURANCE</small> 	
<small>TEST DEPARTMENT</small> 	7/6/97	<small>OTHER</small> 	

MODEL NUMBER:	PROCEDURE NUMBER:	PAGE: 2 OF 4
T7 OXYGEN SENSOR	TP-51327	REV.: 5 REV. DATE: 1/13/97
		ECO #: 97-0026

## 1.0 INTRODUCTION

The purpose of this test procedure is to define the testing parameters and methods by which Class T7 Oxygen Sensors should be tested.

## 2.0 APPLICABLE DOCUMENTS

- 2.1 B51494, Spec Control Drawing, Class T7
- 2.2 QA406 Medical Instrument & Assembled Package Final QC Inspection

## 3.0 TEST OBJECTIVE

The objective of this test procedure is to verify that Class T7 Oxygen Sensors comply with the output and linearity performance specifications delineated in Spec Control Dwg B51492. It is not necessary to perform response tests since when the output of the cells are within the specified limits, so will be the response time.

## 4.0 TEST DESCRIPTION

This procedure is composed of two sections: 1) In-process Output Adjustment to be conducted on 100% of the lot, 2) Final Assembly Acceptance Test of the Output (to be conducted on 100% of the lot) and Linearity Ratio (to be conducted on the quantity specified in Sample Size Chart, Attachment 1). These tests should be performed using the following Test Equipment and Test Setup.

## 5.0 TEST EQUIPMENT

- 5.1 T7 Reference Simulator (SEN 135)
- 5.2 TED 200 Oxygen Analyzer
- 5.3 Cable Assembly (C885)
- 5.4 Flow-thru Block
- 5.5 Specially modified TED 60 (reads to 3 significant digits) (SEN-136)
- 5.6 Flow Meter for measuring flow of Oxygen

## 6.0 TEST SETUP

For the linearity ratio test screw each test item into the flow-thru block to allow air and 100% oxygen to be flown over the sensing surface. The following step-by-step procedures should be followed for each test item:

## 7.0 RECORDS MAINTAINED

Test results should be attached and filled with Work Order Route Sheet.

MODEL NUMBER:		PROCEDURE NUMBER:	PAGE: 3 OF 4
T7 OXYGEN SENSOR		TP-51327	REV.: 5 REV. DATE: 1/13/97
			ECO #: 97-0026

STEP #	OPERATOR ACTION	RESULT	TOLERANCE
1	Note: Make sure that the T7 Reference Simulator does not require calibration (check calibration due date). Remove the battery cover and measure the battery voltage. Replace battery if necessary		6.0 to 9.0 Volts
2	Calibrate a TED 200 using the 21% output of the Reference Simulator by connecting the simulator cable to the analyzer and pressing the CAL button twice.	Display will read 21.	
	IN PROCESS OUTPUT ADJUSTMENT		
3	Replace the simulator with a C885 cable assembly.		
4	Test T7 assemblies that have a clamp installed but <u>do not</u> have the diverter cap or rear cover installed. The acceptable output range of the T7 cell assembly is 17 - 21. Connect each T7 cell assembly to the cable in turn and adjust the trim pot on the pc board to a reading of 20 - 21 (near the upper limit of the acceptable range) or as close as possible.	Acceptable reading is 17 to 21.	
5	Reject all assemblies that do not read in the acceptable range. Proceed with final assembly	Rework rejects where possible.	
	FINAL ACCEPTANCE TEST		
6	OUTPUT TEST- Check the in air output of all T7 cells in the lot using a TED 200 Oxygen Analyzer that has been calibrated using the T7 Reference Simulator (SEN 125).	Acceptable reading is 17 to 21.	
7	LINEARITY RATIO TEST- (Note: the sample size for this test should be determined by looking up the lot size on Attachment 1, page 5 and finding the corresponding sample size). Screw the test item into the Flow-thru Block and connect the Specially Modified TED 60 (SEN 136) into the connector of the cell. (Note: let the reading stabilize before taking the in air reading.)	Note the in air reading on the TED 60.	
8	Start the flow of 100% oxygen at 3 SCFH. Flow for 1-2 minutes.	Note the 100% oxygen reading.	
9	Compute the ratio of the in air output over the output in 100% oxygen for each test item. Example: Reading in air = .313, reading in 100% O2 = 1.474. $.313/1.474 = .212$	Acceptable ratios are .200 to .220	
10	Record AQL sample size and a pass/fail statement on the applicable route sheet. If any of the test samples fail the Linearity Ratio Test, notify QC.		

MODEL NUMBER:	PROCEDURE NUMBER:	PAGE: 4 OF 4
T7 OXYGEN SENSOR	TP-51327	REV.: 5 REV. DATE: 1/13/97
		ECO #: 97-0026

# ATTACHMENT 1

SAMPLE SIZE CHART			
LOT OR BATCH SIZE			SELECT
2	TO	8	3
9	TO	15	5
16	TO	25	8
26	TO	50	13
51	TO	90	20
91	TO	150	32
151	TO	280	50
281	TO	500	80
501	TO	1200	125
1201	TO	3200	300
3201	TO	10000	315
10001	TO	35000	500
35001	TO	150000	800
150001	TO	500000	1250
500001	AND	OVER	2000

REJECT ON ONE (1) FOR EACH SAMPLE SIZE