


## CERTIFICATION PROGRAM

United Process Controls' probe certification program is designed to maximize the life of a probe and ensure the most accurate readings possible.

All probes are tested in a certified atmosphere against a probe standard and must meet deviation criteria.

### Our program includes the following:

- Mechanical Inspection
- Millivolt (sensor output) measurement in a certified atmosphere
- Probe thermocouple verification
- Impedance Testing
- Recovery Testing
- Leak Testing/Reference air flow verification

 If a probe should fail testing, UPC recommends repair or replacement.



**Suitable for Any Make  
of Oxygen Probe**

## EVALUATION TECHNIQUES

### Ensure the Performance of Your Probe

#### Mechanical Inspection

Each probe is carefully inspected for condition by a skilled UPC technician. Any indications of soot, contamination, fatigue, chemical attack and any other mechanical problem are noted and recommendations are provided based on the "as found" condition of the probe.

#### Millivolt Measurement (Sensor Output)

Probe millivolt output is measured in a certified atmosphere and compared to a reference standard. Certification contains reference standard reading, allowable deviation, actual reading, and pass/fail result.

#### Probe Thermocouple Verification

Probes are tested at 1750°F (954°C) against a certified standard.

Certification contains reference standard reading, allowable deviation, actual reading, and pass/fail result.



## EVALUATION TECHNIQUES

### Impedance Test

Impedance testing is a long-accepted, standard method for the indication of probe condition. This test clearly assesses the health of the probe's electrode contact.

As a probe ages, the millivolt output and recovery time are affected by minute soot particulates in the electrode interface, or by mechanical and contamination issues with the electrode interface. For this test, the millivolt output of the sensor is compared to the reading taken prior to the test.

### Recovery Test

With time and usage, it's possible for the zirconia electrolyte of the probe to destabilize and for the electrode contact to deteriorate.

Recovery time of the millivolt reading before and after the impedance test provides an excellent indication of these conditions.

### Leak Testing / Reference Air Verification

During the test, the sensor is placed in the furnace atmosphere and the reference air supply is disconnected. If there's a leakage in the probe electrolyte, the millivolt output would drop beyond the tolerance limit.

Impedance		Burnoff	
Date	5/29/14	Date	5/29/14
Time	12:42	Time	12:42
Impedance(ohm)	3.1K	Temperature	1749
Recovery Time	0:04	Measured mV	1147
		Recovery Time	0:58

PROBE MANUFACTURING AND TEST CERTIFICATE			
Tested by UPC, ISO 9001:2008 Certified			
Description	20"[500mm] NITROCARB 'K' T/C 1/4" CPI		
Serial Number	14031562201	T/C Type	K
Part Number	AA620-K-19	Furnace	2
Test Number	1404021050	Furnace Port	4
Time of Test	10:50	Reference Temp	1750°F
Initials	GSTAFF	Date of Test	04/02/14

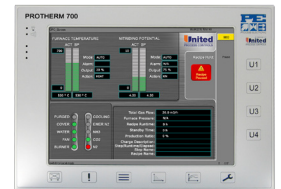
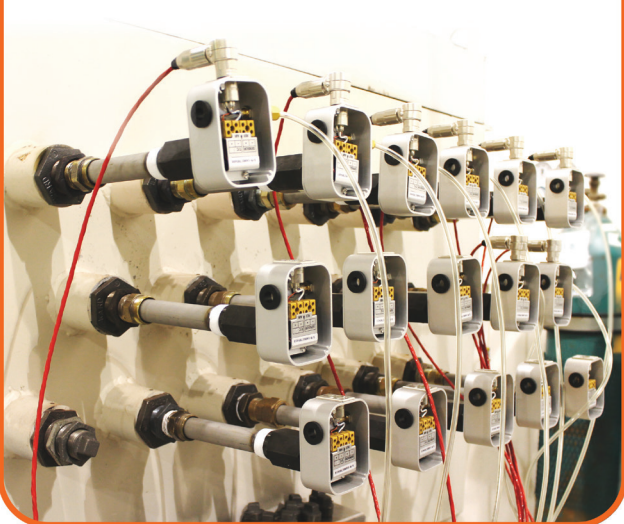
	Measurement	Standard	Tolerance	
Sensor Temp	1725 °F	1750 °F	± 25 °F	PASSED
mV Reading before impedance	84.3 mV	80.2 mV	± 5.0 mV	PASSED
Impedance	2.9 KΩ	≤ 3 KΩ		PASSED
mV Reading after impedance	84.2 mV	± 3 mV deviation		PASSED
Impedance Recovery Time	1.0 sec	≤ 2 Sec		PASSED
Ref air shut-off, leak test mV	85.4 mV	≥ -3 mV deviation		PASSED

RESULTS CERTIFIED BY: \_\_\_\_\_

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Probe Test Certification

**Our large capacity test furnaces help keep turnaround times fast.**



United Process Controls offers instrumentation & accessories that can automatically perform some of these tests in-situ.

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