



# Model A-10050-A0 Microprocessor-based Oxygen Analyzer Electronics

## STANDARD FEATURES

- Universal probe application.
- Standard NEMA 4X cabinet.
- Automatic, semi-automatic & manual calibration modes.
- Combustion efficiency calculation (option).
- RS485 modbus RTU communications with selectable baud rates.
- Rugged industrial design.
- Menu-driven setup.
- Multiple alarm outputs.
- Probe diagnostics.
- Highly visible two-line alphanumeric display.
- Retrofit for earlier electronics.
- Monitors probe conditions.

## INTRODUCTION

Cleveland Controls is a pioneer in the application of zirconium oxide ( $ZrO_2$ ) oxygen analyzers to flue gas analysis. The Model A-10050-A0 is Hays Cleveland's new state of the art oxygen analyzer electronics suitable for use with any Cleveland Controls oxygen analyzer probe.

Used in conjunction with a probe, the analyzer electronics displays and transmits the oxygen signal for recording and control functions. The electronics also includes basic functions to maintain the cell at its optimum temperature and monitor probe life. If a



flue gas temperature input is provided, the A10050-A0 Electronics can compute combustion efficiency for the boiler firing one of numerous different fuels.

The following current Cleveland Controls Oxygen Analyzer Probes are compatible with the A10050-A0 Electronics unit. For additional information on Cleveland Controls Oxygen Analyzers, please refer to the bulletins referenced.

- Model A-08562 MINI-O2™ Oxygen Analyzer Probe, field-repairable, used in gas, oil, and solid fuel firetube industrial boiler applications. See Bulletin **BA08562A0**.

- Model A-10018 OXY-MIZER™ Oxygen Analyzer Probe, field-repairable, the industrial standard for large fire tube boilers and water tube boilers burning any type of fuel. See Bulletin **BA10018A0**.

- Model A-10007 OXYPROBE™ Oxygen Analyzer Probe, field-repairable, used in severe duty applications such as power generation, incineration and rotary kilns. See Bulletin **BA10007B0**.

See Bulletin **BD06120** for flue gas temperature sensor/transmitter as input for combustion efficiency calculation.

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SPECIFICATIONS

for Model A10050-A0 Oxygen Analyzer Electronics

Electrical Power Requirement:

120 VAC, +/-10%, 50/60 Hz, 374 VA maximum.

Start Up: 170 VA, 30 minutes.

Operating: 40 to 100 VA, continuous.

Fuses:

- Electronics (Indicating Transmitter): 1A.
- Temperature control: 4A.

Ambient Temperature: 32 to 131F (0 to 55C).

Relative Humidity: 0-90% non-condensing.

Enclosure: NEMA 4X; fiberglass; surface-mounting, with semi-flush panel cutout. Mounting bezel available.

Shipping Weight: <10 pounds (7 lbs. net).

Display: vacuum fluorescent.

Selectable displays (standard):

- % oxygen
- sensor DC mV & status
- operating temperature and status
- alarm status
- calibration status

Additional displays with efficiency options:

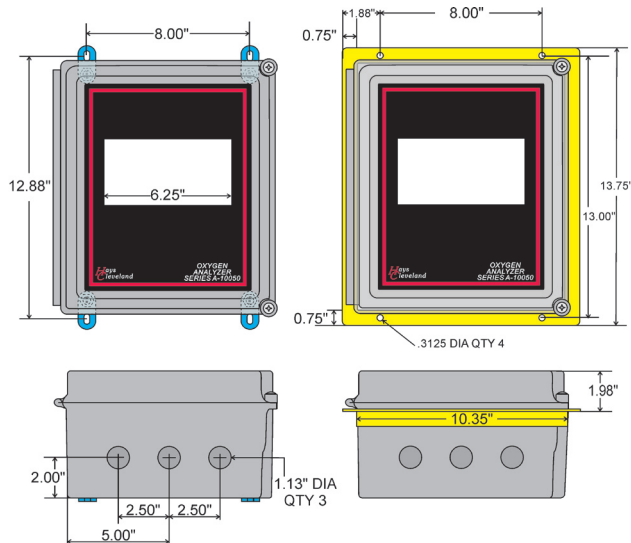
- flue gas temperature
- combustion air temperature
- % combustion efficiency

Temperature Control for Models A08561 & A08562 probes:

- Temperature Sensor: Type K (chromel/alumel) thermocouple
- Output to Heater: 120 VAC, 1/2 wave.
- 750C nominal operating temperature
- Open T/C shut off protection.

Temperature Control for Models A10007, A10018 & A10021 probes:

- Temperature Sensor: 100Ω platinum RTD.
- Output to Heater: 55 VAC.
- 820C nominal operating temperature
- Open & shorted RTD shut off protection.



Analog Inputs:

- Two 4-20 mADC into 100Ω (internal):
- Flue Gas Temperature
- Combustion Air Temperature

Analog Outputs:

- Two 4-20 mADC into 750 ohms maximum. Ground isolated. User assigned and ranged. Assignable failure modes.
- Excess Oxygen, 0 to 1 through 0 to 25%.
- Analyzer sensor, 0 through 300 mV DC.
- Combustion Efficiency, 0 to 100% through 50 to 100%.
- Flue Gas Temperature, same scaling as input signal.

Discreet Inputs:

- All: 120 Vac input.
- Auto-Cal: initiate automatic calibration sequence from external switch.
- Fuel 1 & Fuel 2: selections for combustion efficiency computations.
- Alarm 1 & Alarm 2 Reset: remote reset of latching alarms.

Alarms & Relay Outputs:

- All: SPDT, NEMA Form C dry contacts. 10 AAC, resistive.
  - Alarm 1 & Alarm 2: assignable for high or low O<sub>2</sub>, analyzer sensor DC mV, efficiency or flue gas temperature. Selectable for manual reset (latching) with local or remote reset, or auto reset (non-latching).
  - Sensor Failure: heater, thermocouple, RTD or sensor impedance.
  - Calibration Air: & Calibration Test Gas: used with solenoid operated calibration valves for automatic calibration.
  - Calibration in Progress: alert controls or other devices when calibrating.
  - Communications: Modbus RTU. 9,600 or 19,200 baud rate, selectable.
- The following auxiliaries are available for use with the electronics:
- Semi-Automatic Calibration uses a manual flow (calibration) panel and calibration gases consisting of dry instrument air and 4.5% nominal O<sub>2</sub> in N<sub>2</sub> (cylinder).
  - Automatic Calibration uses a solenoid-operated flow (calibration) panel and calibration gases consisting of dry instrument air and 4.5% nominal O<sub>2</sub> in N<sub>2</sub> (cylinder). Automatic calibration can be initiated automatically via the real time clock, operator interface, and remote switch input.
  - Flue Gas Temperature & Combustion Efficiency use a transmitter or Hays Cleveland's Model D-06120 for computing combustion efficiency.
  - Combustion Air Temperature Transmitter provides automatic correction to the combustion efficiency computation.

NOMENCLATURE

Model Code: A-10050-A0-	
Codes	Description
Base	A-10050-A0 Analyzer Electronics
- A0	Current Model Designation:
A: Electronics Mounting & Probe Configuration	
-A01	Semi-flush panel mount, NEMA 4X: electronics configured for use with A-10007, A-10018 or A-10021 analyzer probe.
-A02	Semi-flush panel mount, NEMA 4X: electronics configured for use with A-08560 or A-08562 analyzer probe.
-A03	Surface-mount, NEMA 4X: electronics configured for use with A-10007, A-10018 or A-10021 analyzer probe.
-A04	Surface-mount, NEMA 4X: electronics configured for use with A-08560 or A-08562 analyzer probe.

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