



Stainless Steel Dissolved Oxygen Electrodes



DISSOLVED OXYGEN ELECTRODES

The steam sterilizable family of dissolved oxygen electrodes from the pHoenix Electrode Company is specifically designed for fermentation where it is necessary to subject electrodes to repeated steam sterilization.

Dissolved oxygen electrodes are available in both polarographic and galvanic styles to fulfill all requirements. pHoenix O₂ electrodes are compatible with most common O₂ amplifiers found in fermentation. Polarographic electrodes are designed to be used with pHoenix Electrode Company, Ingold IL, Cole-Parmer and Applikon O₂ amplifiers, or with other amplifiers that are designed to be used with Ingold dissolved oxygen electrodes.

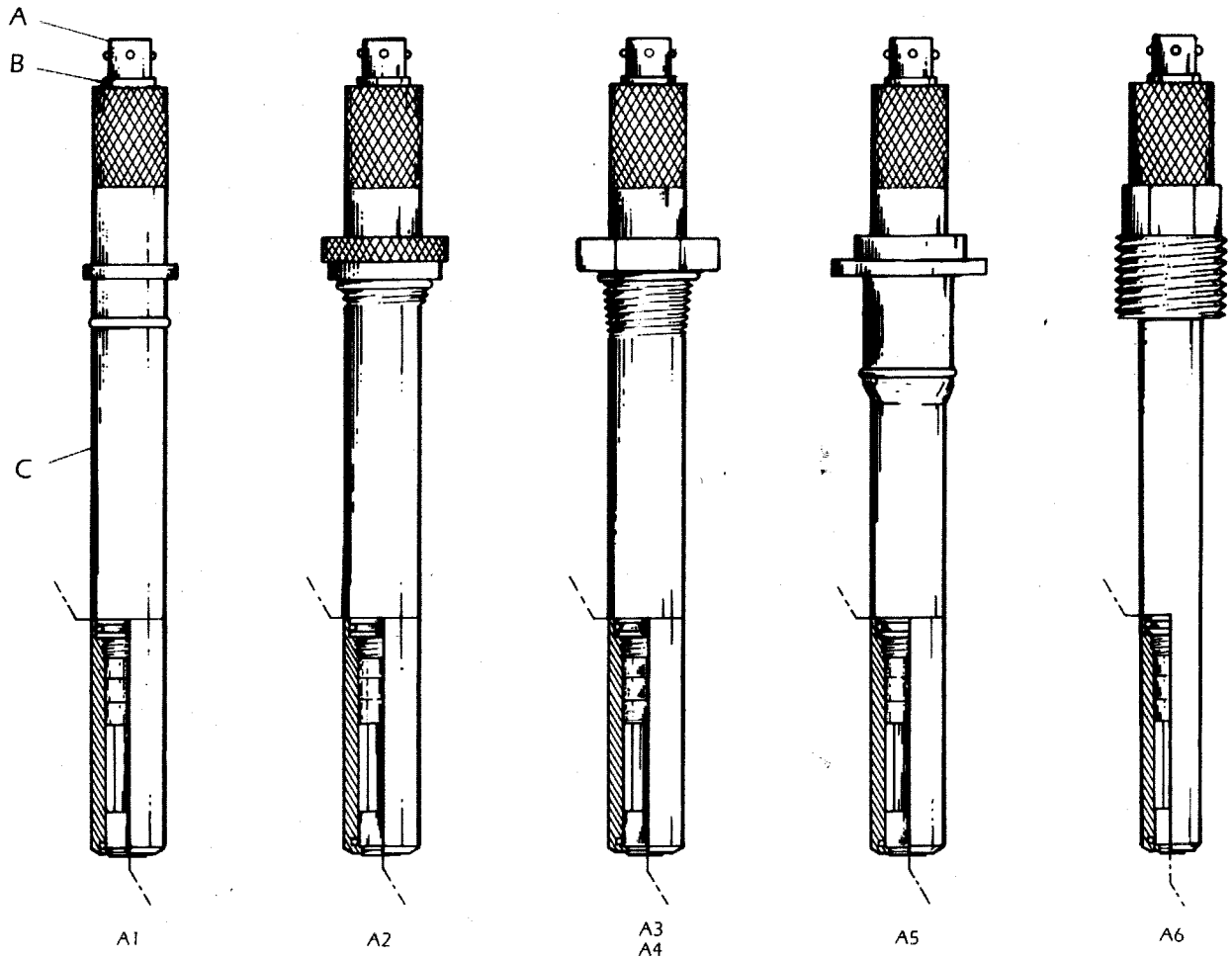
Galvanic electrodes are designed to be used with pHoenix Electrode Company, New Brunswick Scientific, LSL Biolafitte and Applikon O₂ amplifiers.

The DO probes are available for laboratory fermentation where sterilization takes place in a separate autoclave or industrial applications where sterilization takes place in-situ.

The easily replaced electrode membrane cartridge is a unique feature of the pHoenix polarographic and NBS galvanic dissolved oxygen electrodes. The membrane is of special construction—a silicone and teflon composite, reinforced with stainless steel mesh. This unique membrane is very rugged and allows for repeated sterilization without damage, allowing it to withstand severe conditions. The electrode operates without maintenance for 5 to 10 sterilizations, fermentation cycles or, in terms of time, for 6 to 8 weeks. The pHoenix Biolafitte type galvanic dissolved oxygen electrode features easily replaceable FEP teflon membranes.

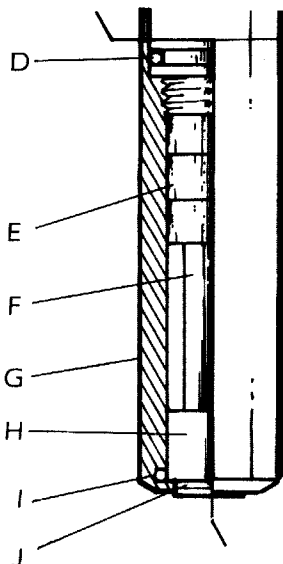
The polarographic dissolved oxygen electrodes are available with or without automatic temperature compensation. They are designed to match the Ingold IL oxygen amplifier. Temperature compensation is not normally required when calibration is made at the same temperature as the controlled fermentation temperature with no variation.

SPECIFICATIONS



OXYGEN ELECTRODE ASSEMBLY

MOUNTINGS



- A. Detachable lead
- B. O-ring seal
- C. 316L Stainless steel body
- D. O-ring
- E. Expansion Foams
- F. Anode
- G. Membrane Cover
- H. Replacement Membrane Cartridge
- I. O-ring
- J. Cathode

| FIGURE | TYPE | DESCRIPTION | BODY DIAMETER |
|--------|------|--------------------|---------------|
| A1 | 07 | 19mm socket flange | 19mm |
| A2 | 05 | M18 x 1.5 | 16mm |
| A3 | 03 | 3/4" NPT | 19mm |
| A4 | 01 | 3/8" NPT | 14mm |
| A5 | 08 | 25mm socket flange | 19mm |
| A6 | 10 | No Thread | 12mm |
| A6 | 11 | PG 13.5 | 12mm |

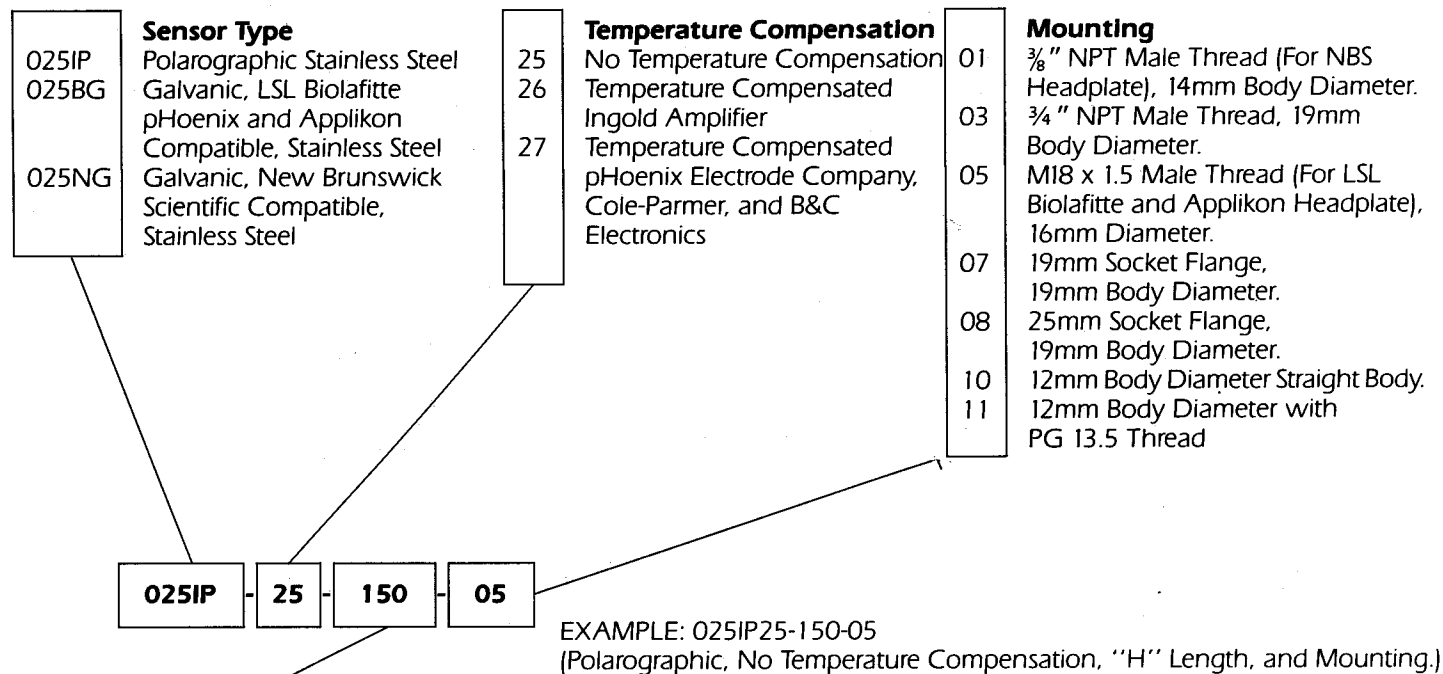
SPECIFICATIONS

| TYPE | 025IP25 Polarographic | 025IP26 Polarographic | 025IP27 Polarographic | 025BG25 Galvanic | 025NG25 Galvanic |
|---------------------------|--------------------------|--------------------------|--------------------------|---------------------|---------------------|
| CATHODE | Pt | Pt | Pt | Ag | Pt |
| ANODE | Ag/AgCl | Ag/AgCl | Ag/AgCl | Pb | Pb |
| RESPONSE | 98% 60 Seconds | 98% 60 Seconds | 98% 60 Seconds | 98% 60 Seconds | 98% 60 Seconds |
| STABILITY ¹ | Better Than 2% | Better Than 2% | Better Than 2% | Better Than 2% | Better Than 2% |
| TEMPERATURE COMPENSATION | NO | YES | YES | NO | NO |
| TEMPERATURE RANGE | 0-80 °c | 0-80 °c | 0-80 °c | 0-80 °c | 0-80 °c |
| STERILIZATION TEMPERATURE | 130 °c | 130 °c | 130 °c | 130 °c | 130 °c |
| RESIDUAL SIGNAL | Less Than 1nA | Less Than 1nA | Less Than 1nA | 0.5-1mV | Less Than 0.4uA |
| OUTPUT ² | 50nA | 50nA | 50nA | 35mV±10mV | 10-15uA |

¹ = Constant Temperature

² = Medium Saturated With Air

ORDERING INFORMATION



| "H" Length | | Galvanic (LSL Biolafitte Fermentor) | | Galvanic (NBS Fermentor) | |
|------------|-------------------------------------|-------------------------------------|-----------------------------|--------------------------|-----------------------------|
| 70mm | 08 Mounting | 70mm | 08 Mounting | 127mm | 01, 08, 10 and 11 Mountings |
| 120mm | 10 and 11 Mountings | 150mm | 05, 08, 10 and 11 Mountings | 186mm | 01, 08, 10 and 11 Mountings |
| 150mm | 03, 05, 07 and 08 Mountings | 220mm | 05, 10 and 11 Mountings | 229mm | 01, 08, 10 and 11 Mountings |
| 220mm | 03, 05, 07, 08, 10 and 11 Mountings | 320mm | 05, 10 and 11 Mountings | 308mm | 01 and 08 Mountings |
| 320mm | 03, 05, 07, 08, 10 and 11 Mountings | 420mm | 05 Mounting | 355mm | 01 and 08 Mountings |
| 420mm | 05, 07, and 08 Mountings | 440mm | 05 Mountings | 360mm | 01 and 08 Mountings |
| XXXmm | Special Order "H" Length | | | 432mm | 01 and 08 Mountings |
| | | | | 559mm | 01 and 08 Mountings |
| | | | | 711mm | 01 and 08 Mountings |

MEMBRANE SERVICE KITS AND MEMBRANES

POLAROGRAPHIC TYPES

| | |
|------------|--|
| M0500P1-K1 | Membrane Service Kit for polarographic O ₂ electrodes with 3/4" NPT, 19mm or 25mm mounting with 19mm O.D. body diameter. Consists of replacement O-rings, 3 replaceable membrane cartridges, expansion foams, tool, and a 125ml bottle of electrolyte. |
| M0500P1-K2 | Membrane Service Kit for polarographic O ₂ electrodes with M18 x 1.5 mounting with 16mm O.D. body diameter. Consists of replacement O-rings, 3 replaceable membrane cartridges, expansion foams, tool, and a 125ml bottle of electrolyte. |
| M0500P1-K5 | Membrane Service Kit for polarographic O ₂ electrodes with PG 13.5 or 12mm mounting with 12mm O.D. body diameter. Consists of replacement O-rings, 3 replaceable membrane cartridges, expansion foams, tool, and a 125ml bottle of electrolyte. |
| M0500P1-M1 | Replacement Membrane consists of one membrane cartridge and replacement O-rings for 3/4" NPT, 19mm or 25mm mounting, 19mm O.D. body diameter. |
| M0500P2-M2 | Replacement Membrane consists of one membrane cartridge and replacement O-rings for M18 x 1.5 mounting, 16mm O.D. body diameter. |
| M0500P2-M6 | Replacement Membrane consists of one membrane cartridge and replacement O-rings for PG 13.5 or 12mm mounting, 12mm O.D. body diameter. |
| R001068 | Polarographic O₂ electrode filling solution 125 ml |

GALVANIC TYPES

| | |
|------------|--|
| M050BG1-K3 | Membrane Service Kit for galvanic O ₂ electrodes with M18 x 1.5, 19mm or 25mm socket with 16mm O.D. body diameter. Consists of 10 membranes (5 each of 1 and 2 mil), replacement O-rings, tool, and a 125ml bottle of electrolyte. |
| M050NG1-K4 | Membrane Service Kit for galvanic O ₂ electrodes with 3/8" NPT mounting with 14mm O.D. body diameter. Consists of replacement O-rings, 3 replaceable membrane cartridges, expansion foams, tool, and a 125ml bottle of electrolyte. |
| M050NG1-K1 | Membrane Service Kit for galvanic O ₂ electrodes with PG 13.5 or 12mm mounting with 12mm O.D. body diameter. Consists of replacement O-rings, 3 replaceable membrane cartridges, expansion foams, tool, and a 125ml bottle of electrolyte. |
| M050BG2-M3 | Replacement Membrane consists of 10 membranes 1 mil thick and replacement O-rings for M18 x 1.5, 19mm and 25mm mountings, 16mm O.D. body diameter. |
| M050BG2-M5 | Replacement Membrane consists of 10 membranes 2 mil thick and replacement O-rings for M18 x 1.5, 19mm and 25mm mountings, 16mm O.D. body diameter. |
| M050NG2-M4 | Replacement Membrane consists of one membrane cartridge and replacement O-rings for 3/8" NPT mounting, 14mm O.D. body diameter. |
| M050NG1-M1 | Replacement Membrane consists of one membrane cartridge and replacement O-rings for PG 13.5 or 12mm mounting, 12mm O.D. body diameter. |
| R001069-1 | Galvanic O₂ electrode filling solution 125ml. |

CABLES

C1 TYPE CABLES

For non-temperature compensated O₂ electrodes, used with both polarographic and galvanic O₂ electrodes. Standard 3 meter lead.

| | |
|---------------|---|
| 9001091-010B | BNC connector |
| 9001091-010I | DIN connector for use with Ingold pO ₂ amplifier |
| 9001091-010D | Dual pin connector for use with NBS galvanic pO ₂ amplifier |
| 9001091-010U | Banana plugs for use with LSL Biolafitte pO ₂ amplifier |
| 9001091-010T | No connector for pHoenix, Applikon, and Cole-Parmer pO ₂ amplifiers or for use when user supplies connector. |
| 9001091-010CC | Custom cable with choice of plug, lemo connector. Specify size and pin number. |
| 9001093-010D | Pin connector, for use with 025NG15 and 027NG15 galvanic O ₂ electrode. Cable features a load resistor for direct connection to a recorder with mV input. (Approx. 40 mV saturated air/water). |
| 9001096-010D | Amphenol 4-Pin Electrode head connector to pin connector for use with NBS pO ₂ amplifier |
| 9001096-003 | Amphenol detachable lead to Amp 4-Pin connector for use with NBS pO ₂ amplifier |

C2 TYPE CABLES

For polarographic temperature compensated O₂ electrodes. Standard 3 meter lead.

| | |
|---------------|---|
| 9001092-010I | DIN connector + pins for use with Ingold pO ₂ amplifier. |
| 9001092-010T | No connector for pHoenix, Applikon and Cole-Parmer pO ₂ amplifiers, or for use when user supplies connector. |
| 9001092-010CC | Custom cable with choice of plug type, lemo connector. Specify plug size and pin number. |
| 9001097-003 | Amphenol 4-Pin Electrode head connector to Amp 4-Pin Connector. For polarographic electrodes. NBS |

Note: Longer lead length are available on special order.