

Dissolved Oxygen Measurement System with Air Blast Cleaner

- COMPLETE SYSTEM INCLUDES sensor, analyzer, sensor washer head, mounting hardware, and air compressor.
- AIR BLAST CLEANER system can keep DO sensors functioning up to 3 months or longer.
- SENSOR MAINTENANCE is quick and easy.
- FEATURE-PACKED ANALYZER: on-board pressure sensor for completely automatic air calibration, large backlit display, dual outputs, three fully programmable alarm relays.



FEATURES AND BENEFITS

The Model DO-03/04 is a complete system for the determination of dissolved oxygen in wastewater aeration basins. It consists of a sensor, an analyzer, a handrail mounting assembly, a sensor washer head, and an air compressor. A timer in the analyzer allows the user to customize the air blast cleaning cycle.

The Model DO-03/04 uses a membrane-covered amperometric sensor. A polarizing voltage applied to a gold cathode behind the membrane destroys oxygen diffusing through the membrane and keeps the concentration of oxygen in the sensor equal to zero. The current generated by the cathode reaction is proportional to the rate of diffusion of oxygen through the membrane. Because the concentration of oxygen in the sensor is zero, the diffusion rate and the current are proportional to the concentration of oxygen in the sample.

Sensor maintenance is fast and easy. Replacing a membrane requires no special tools or fixtures. A screw cap holds the pre-tensioned membrane in place. Replacing the electrolyte solution takes only minutes.

The Model DO-03/04 includes the rugged, easy-to-use Model 54eA analyzer. The analyzer features two fully

programmable 4-20 mA outputs, and three fully programmable alarm relays. The backlit three line display allows the user to read oxygen levels at a glance. The analyzer permits both air calibration and calibration against a laboratory instrument. Air calibration is completely automatic. All the user does is expose the sensor to water-saturated air and press a few buttons.

The Air Blast Sensor Cleaner, which includes the washer head and air compressor, keeps the sensor membrane clean, helping ensure reliable, trouble-free oxygen measurements and reducing sensor cleaning maintenance to as little as every three months. At programmed intervals, the air blast cleaner blows a stream of air across the membrane to clear bio-film from on the membrane. The frequency and duration of the air blast is programmable from the 54eA analyzer.

The photograph shows a sensor after nine weeks in an aeration basin. The cathode is clearly visible under the membrane. A 60-second air blast every eight hours is keeping the membrane clean.

Plant service air can be used in place of the air compressor. The 54eA analyzer relay is then used to operate a solenoid valve.

SPECIFICATIONS - 499ADO-54 SENSOR

Range: 0 to 20 ppm (mg/L)

Wetted parts: Noryl¹ Viton² EPDM, Teflon³, silicone

Cathode: Gold (not normally wetted)

Accuracy: ±0.2 ppm at 25°C

Repeatability: ±0.05 ppm 25°C

Response time: 25 sec to 63% of final reading at 25°C

Pressure: 0 to 65 psig (0 to 549 kPa abs)

Temperature: 32 to 122°F (0 to 50°C)

Process connection: 1 inch MNPT

Electrolyte volume: 25 mL (approx.)

Cable length (standard): 25 ft (7.6 m)

Cable length (maximum): 300 ft (91 m)

SPECIFICATIONS - 54EA-01 ANALYZER

Enclosure: Epoxy-painted (light gray) cast aluminum, NEMA 4X (IP65). 144 x 144 x 132 mm (5.7 x 5.7 x 5.2 in.), DIN size panel cut-out.

Front Panel: Membrane keypad with tactile feedback. Three green LEDs indicate alarm status. Red LED indicates fault condition.

Display: Three-line, back-lit, dot matrix LCD, 70 x 35 mm. First line is oxygen reading. Second line is temperature and current output. Third line is user-selectable. Character heights: 1st line - 16 mm (0.6 in.), 2nd and 3rd lines - 7 mm (0.3 in.).

Power:

115 VAC ± 10%, 50/60 Hz ± 6%, 8 W

230 VAC ± 10%, 50/60 Hz ± 6%, 8 W

RFI/EMI: EN-61326



LVD: EN-61010-1

Outputs: Two 4-20 mA or 0-20 mA isolated outputs. Continuously adjustable. Outputs can be assigned to oxygen or temperature. Output dampening is user-selectable. Maximum load at 100/200 Vac is 550 ohms.

Output Accuracy: ± 0.05 mA

Alarms: Relays 1, 2, and 3 are assignable to oxygen or temperature. One relay can also be used as an interval timer to operate the air blast cleaner.



Relay 4 - Sensor/analyzer fault alarm

Each relay has a dedicated LED on the front panel.

Relay Contacts: Relays 1-3: Epoxy sealed form A contacts, SPST, normally open



Relay 4: Epoxy sealed form C, SPDT

	<u>Resistive</u>	<u>Inductive</u>
115 Vac	5.0 Amps	3.0 Amps
230 Vac	5.0 Amps	1.5 Amps

Ambient Temperature: 0 to 50°C (32 to 122°F).

Analyzer can be operated between -20 and 60°C (-4 to 140°F) with some degradation in display quality.

Relative Humidity: 95% (maximum) non-condensing

Temperature correction for membrane permeability: automatic between 0 and 50°C.

Calibration: automatic air calibration or calibration against a standard instrument

Pressure sensor range: 113 to 862 mm Hg (150 to 1150 mbar)

¹Noryl is a registered trademark of General Electric

²Viton is a registered trademark of E.I. duPont de Nemours & Co.

³Teflon is a registered trademark of E.I. duPont de Nemours & Co.

Specifications subject to change without notice.

SPECIFICATIONS - COMPRESSOR FOR AIR BLAST CLEANER SYSTEM

Enclosure: Fiberglass reinforced polyester with polyester cover, NEMA 4x (IP65). 11.9 x 11.9 x 6.9 in (302 x 302 x 175 mm).

Compressor: Oil-less, non-lubricating piston and cylinder. 1/12 HP permanent split capacitor motor with thermal overload protection.

Maximum continuous pressure: 50 psig (446 kPa abs)

Operating pressure: 20 psig (239 kPa abs)

Air hose: 25 ft (7.6 m) included with ABSH

Ambient temperature: 5 to 122°F (-15 to 50°C) assuming intermittent operation

Power:

Code -03: 115 VAC, 60 Hz or 100 VAC, 50/60 Hz, single phase, 1.3 to 1.4 A, starting current 3.88 A, insulation class B; UL approved



Code -04: 220 VAC, 50 Hz, single phase, 0.6 A, starting current 1.5 A, insulation class A; CE approved



SPECIFICATIONS - AIR BLAST CLEANER SYSTEM WASHER HEAD

Process connection: 1-1/2 inch PVC pipe socket

Dimensions (diameter x length): 2-1/2 x 10-3/4 inches (64 x 273 mm)

Wetted materials: PVC, Noryl, Viton

Pipe boom: 1-1/2 inch schedule 80 PVC, maximum length 12 feet (3.6 m) past handrail mounting clamp. Pipe boom is supplied by customer.

Maximum distance between compressor and sensor: 25 ft (7.6 m). ABSH is supplied with 25 ft (7.6 m) of air hose.

SPECIFICATIONS - HANDRAIL MOUNTING ASSEMBLY

Materials of Construction:

Weather cap: Schedule 40 PVC

Pipe clamp and bracket: Aluminum

Clevis: zinc-plated steel

U-bolts, nuts, and bolts: zinc-plated steel

Washers: stainless steel

SHIPPING INFORMATION

The Model DO-03/04 is shipped in a single container. Shipping weight is 38 lbs (17.5 kg).

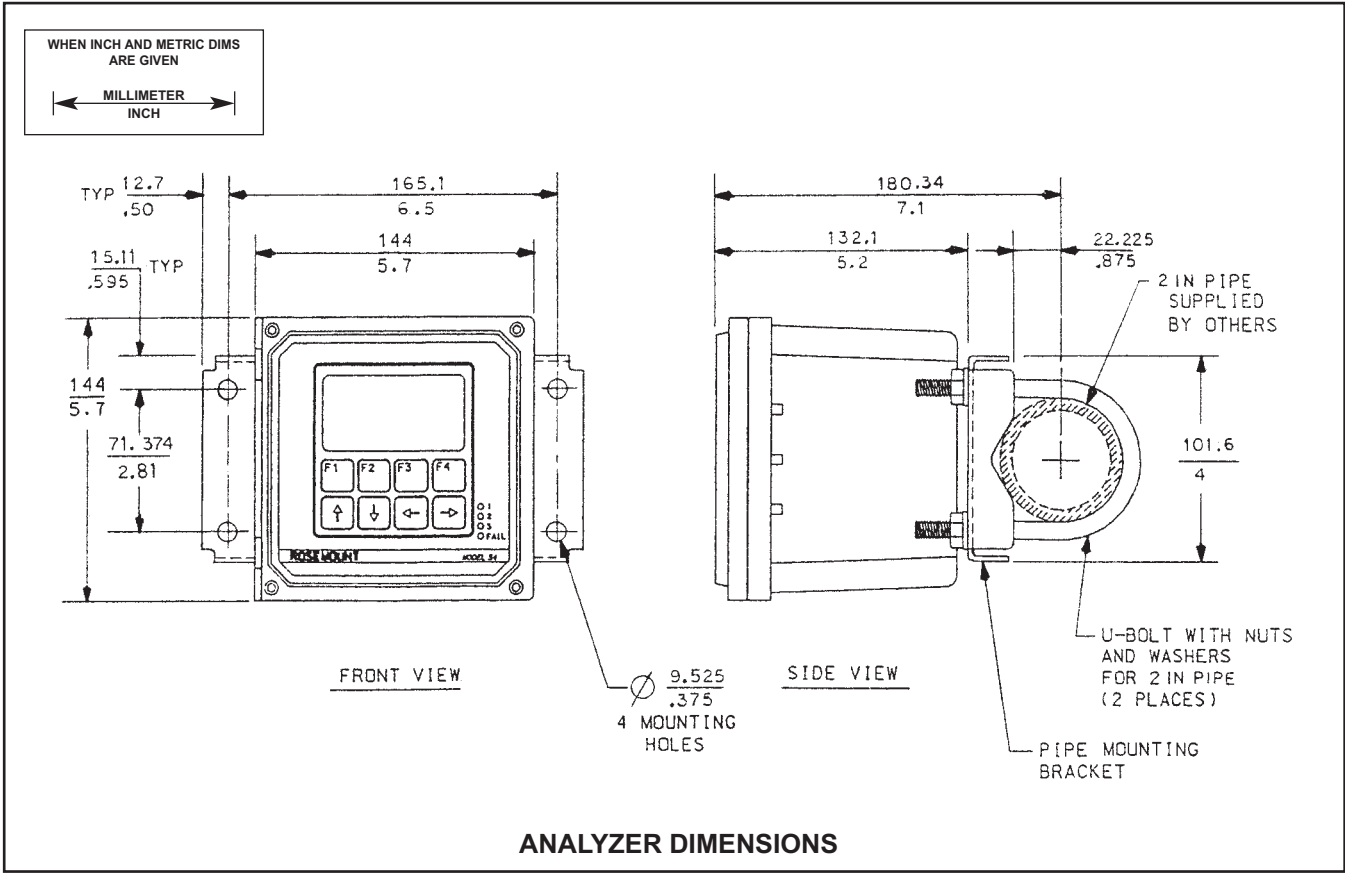
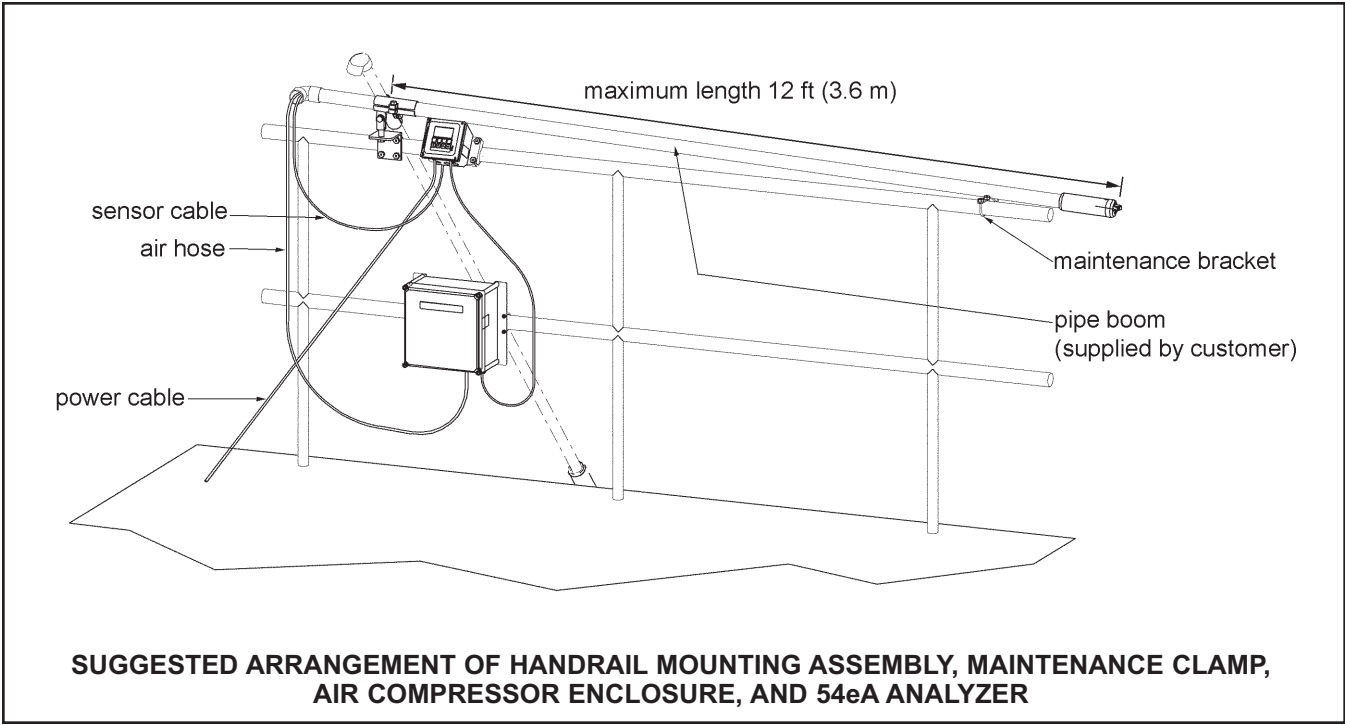
PLANT AIR SYSTEM REQUIREMENTS

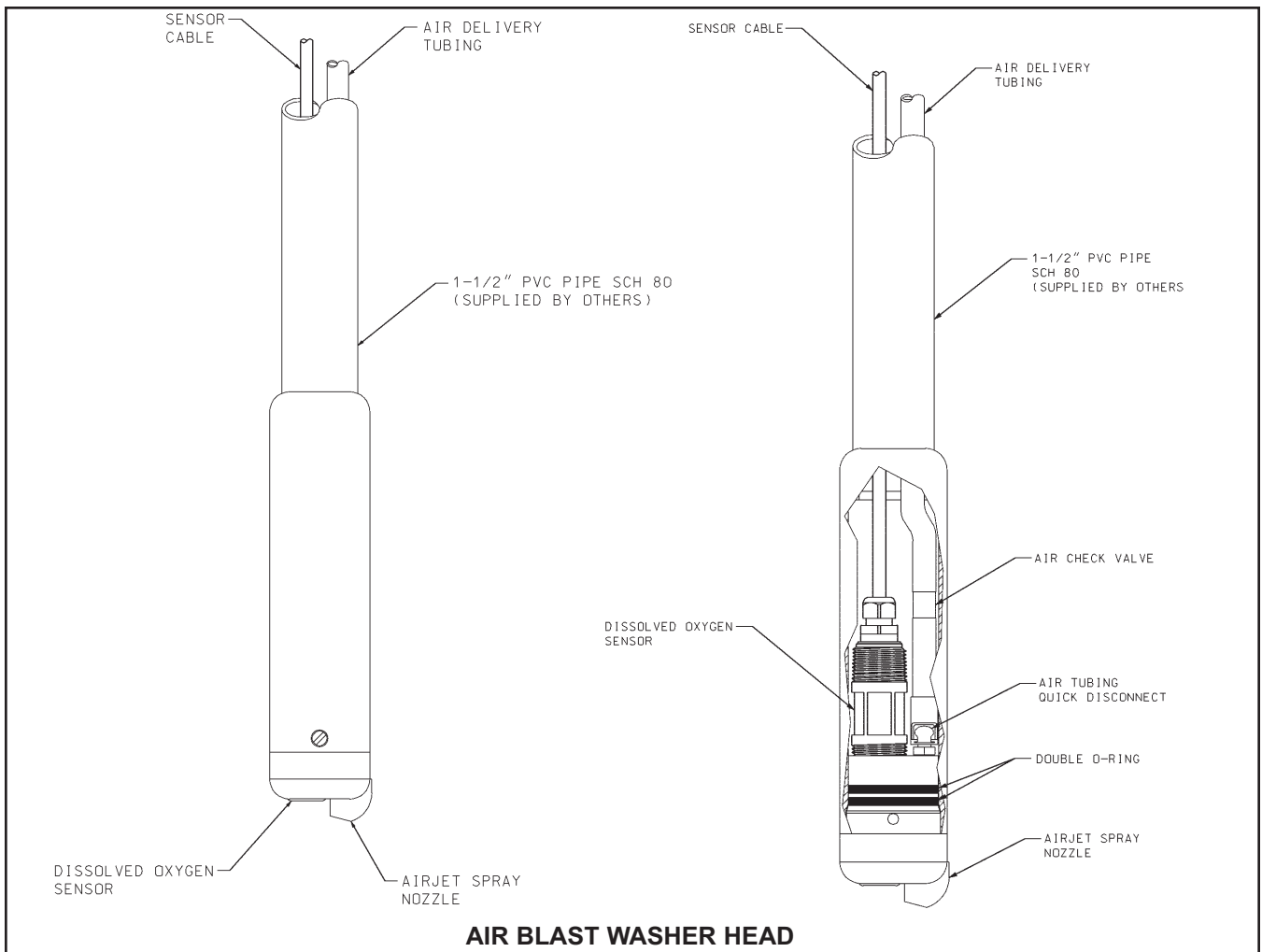
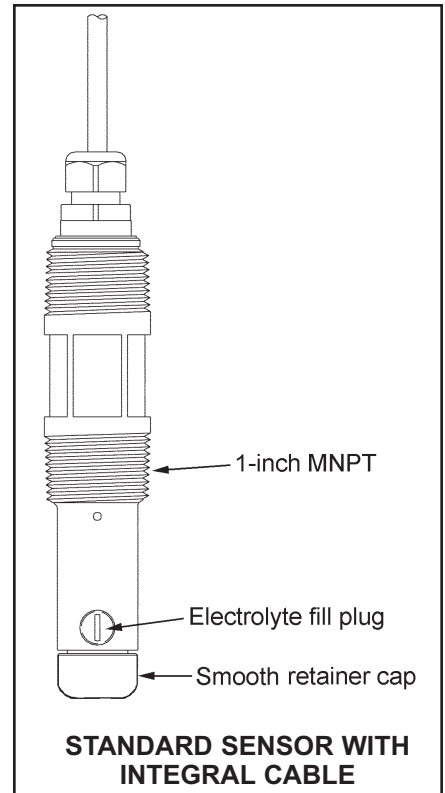
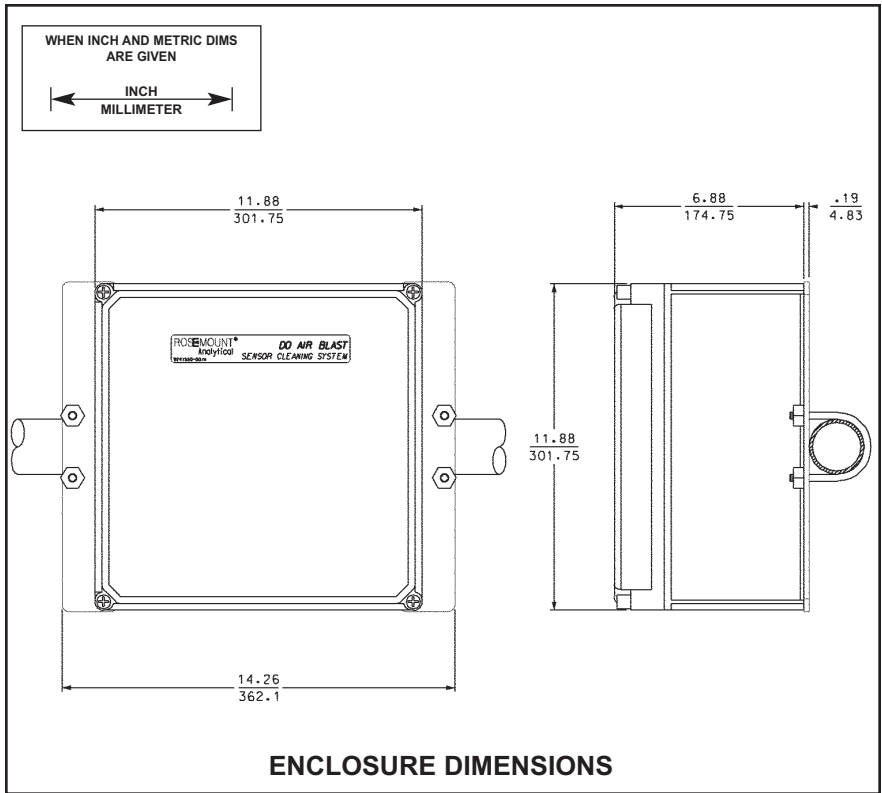
(for customers using plant air in place of air compressor)

Pressure: 20 psig (239 kPa abs)

Flow: 0.50 SCFM (14 L/min at STP)

Air hose: (customer supplied) compatible with ¼ inch barbed fitting for connection at washer head





ORDERING INFORMATION

The Model DO -03/04 is a complete system for the determination of oxygen in wastewater aeration basins. It consists of a 54eA analyzer, a 499ADO-54 oxygen sensor, an air blast washer head with air compressor and hose, and a handrail mounting bracket. All hardware necessary to mount the analyzer and the air compressor enclosure on a handrail is provided. Cable gland fittings for the analyzer are also supplied. Three replacement membranes and a bottle of electrolyte solution are shipped with the sensor. Pipe boom is supplied by customer.

MODEL DO DISSOLVED OXYGEN MEASURING SYSTEM WITH AIR BLAST CLEANER	
MODEL	Description
DO	Dissolved Oxygen Measuring System
CODE	Power (required selection)
-03	115 Vac, 60 Hz or 100 Vac, 50/60 Hz
-04	220 Vac, 50 Hz
DO -03	EXAMPLE

ACCESSORIES FOR 54eA ANALYZER

Part #	DESCRIPTION
9240048-00	Tag, stainless steel, specify marking

CONSUMABLES FOR SENSOR

Part #	DESCRIPTION
23502-00	Membrane replacement kit with O-ring, qty 3
9210264	Amperometric sensor fill solution #1, 4 oz (120 mL)

Customers using plant compressed air should order the following items in place of Model -03/04:

54e-A-01	Model 54eA analyzer
2002577	Mounting bracket for Model 54e, pipe/wall
23554-00	Cable glands kit for Model 54e, qty 5
499ADO-54	Model 499ADO oxygen sensor
24057-00	Smooth membrane retainer for 499ADO sensor
HRMS-02	Handrail clamp assembly for washer head (clamp, sensor maintenance kit, and elbow)
9320101	Elbow, 90° female socket, PVC schedule 40
24049-00	Air blast washer head
9160549	Air hose, 1/4-inch ID x 1/2-inch OD, 25 ft (7.6 m)

REPLACEMENT PARTS AND ACCESSORIES

9380088	Air compressor; 115 Vac, 60 Hz or 100 Vac, 50/60 Hz
9380089	Air compressor; 220 Vac, 50 Hz
24051-00	Mounting hardware for air compressor enclosure
24053-00	O-ring kit for sensor washer head (three O-rings and lube)

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