



DISSOLVED OXYGEN INSTRUMENTATION

Dissolved Oxygen Analyzer/Controller

DOCN600 Series



- ✓ User-Friendly Design with Front Panel Menu
- ✓ Easy to Read, Large, Bright LED Display
- ✓ Quick and Easy to Calibrate
- ✓ 0 to 20 ppm and 0 to 100% Ranges
- ✓ Altitude Compensation
- ✓ Membrane Perforation Alarm
- ✓ 2 Control Relays with Third Relay for High/Low Alarm
- ✓ NEMA 4X Enclosure

DOCN600 Series dissolved oxygen analyzers/controllers are rugged and dependable.

The large, bright LED digital display is clear even in direct sunlight. Speedy calibration and simple operation make these microprocessor-based instruments suitable for a wide variety of demanding industrial and municipal applications. An intuitive step-through menu gives the user access to functions directly from the front panel. By pressing the MENU key, the operator can scroll through the menu, illuminating an LED beside the selected item and displaying the stored value. Arrow keys are used to change the value. Seldom used or set-once adjustments, such as password activation, are located on DIP switches on the back of the swing-out front panel.

The DOCN600 Series instruments accept the DOE-601 mounting assembly fitted with a DOE-601-SC sensor cartridge containing a precisely stretched permeable membrane, electrodes, and electrolyte. The inexpensive, easy-to-change cartridge is hermetically sealed. Optional mounting hardware includes submersion and "ball float" assemblies.

Calibration can be achieved with 1 of 7 techniques: in the process to a portable meter; in clean water to a portable meter; in a process sample to a lab meter; in a clean water sample to a lab meter; in a saturated process; in saturated clean water; and in air. To calibrate, press the MENU key until the CALIBRATION LED



lights up. Use the arrow keys to set the value, determined with one of the above calibration methods. Press the ENTER key twice. The unit is now calibrated.

The DOCN600 Series provides 3 analog outputs: 4 to 20 mA, 0 to 5 Vdc, and 0 to 1 mA. The instrument can also control external devices with its 2 independent relays. An alarm relay has both high and low setpoints with a fixed deadband. When this relay is energized, the ALARM LED on the front panel illuminates to indicate an alarm condition. Factory-set for bidirectional control, both control relays can be set to control either a rising or falling process, with easily programmed RELAY ON and RELAY OFF setpoints.

A self-diagnostics program indicates any system errors or faults by turning the STATUS LED on the front panel from green to red. The operator then selects STATUS from the menu to determine the fault code. The operator's manual indicates the source and likely remedy for the fault. When the fault is corrected, the STATUS LED will turn back to green.

DOCN600 Series instruments feature a rugged NEMA 4X fiberglass-reinforced polyester enclosure. They are ideal for heavy-duty outdoor applications, such as those involving municipal and industrial wastewater.



Specifications

Accuracy:

% Saturation: $\pm 1\%$
ppm: ± 0.1
Temperature: $\pm 0.2^\circ\text{C}$

Resolution:

% Saturation: 0.1
ppm: 0.01
Temperature: 0.1°C

Repeatability: 0.1% of span or better

Stability: 0.1% of span per 24 hours non-cumulative

Temperature Drift:

Zero: 0.01% of span per $^\circ\text{C}$
Span: 0.01% of span per $^\circ\text{C}$

Response Time: 20 seconds to 90% of value upon step change at 20°C (68°F)

Display: $3\frac{1}{2}$ digit, 7-segment, 2.7 mm ($\frac{1}{8}$ ") LED display; 4 LED indicators: status, alarm, relay A, relay B

Measuring Range: 0 to 20.00 ppm or 0 to 250% saturation of dissolved oxygen

Temperature: 0 to 40°C (32 to 104°F)

Power Requirements:

DOCN602: 98 to 132 Vac, 50/60 Hz (less than 10 VA), or 196 to 264 Vac 50/60 Hz, (less than 10 VA)

Ambient Conditions:

Temperature: -30 to 50°C (-22 to 122°F)
Humidity: 0 to 90% RH, non-condensing

Control Relays:

Control Relays: 2, rated 5 A @ 115/230 Vac; 5 A @ 30 Vdc, SPDT

Bidirectional Relays: Factory-preset for bidirectional control; can be individually field-set for rising or falling process

On/Off Setpoints: Field selectable full scale

Fail-Safe: Normal or fail-safe operation

Alarm Relay:

Number: 1 high and low alarm relay
Rating: 5 A 115/230 Vac; 5 A 30 Vdc

SPDT:

Alarm High: Field selectable full scale

Alarm Low: Field selectable full scale

Deadband: Fixed at 2% of full scale

Fail-Safe: Normal or fail-safe operation indicate status of 2 control relays and alarm relay

Analog Outputs:

Non-Isolated: 0 to 1 mA, 100 W maximum load

Non-Isolated: 0 to 5 Vdc, 1000 W minimum load

Isolated: 4 to 20 mA, 800 W maximum load

Output: Isolated from the input, the ground, line power and all other outputs

Range: Expand outputs can be scaled to represent any segment of the instrument scale to a minimum of 10% of full scale

Output Holds: The analog outputs are automatically placed on hold when the instrument is placed in the menu mode

Temperature: The 0 to 1 mA and 0 to 5V DC output can be selected to track either the dissolved oxygen level of the process or the temperature of the process

Temperature Compensation:

Automatic 0 to 40°C (32 to 104°F)

Diagnostics: Invalid entries identified by flashing LEDs, 2-color STATUS LED indicates system status: green, no fault; red, system fault, status menu value indicates system problem and likely solution, alarm LED turns red when alarm relay is energized, indicating high/low process value or memory loss, test display value and analog outputs can be manually set to any value for testing and diagnostic purposes

Safety and Security:

Operator: Password protected (activated by DIP switch)

Memory: Non-volatile (EPROM)

Microprocessor: Watchdog timer monitors microprocessor, instrument automatically returns to online operation if left in menu mode for more than 10 minutes and no key is pressed

Enclosure: NEMA 4X molded fiberglass reinforced polyester enclosure with four 2.7 mm ($\frac{1}{8}$ ") conduit holes and mounting feet for surface mount; a NEMA 4X plug is provided for 1 hole

Mounting:

Standard: Surface mount

Optional: Panel mount kit or pipe mount kit

Dimensions: 176 H x 165 W x 108 mm D (6.9 x 6.5 x 4.25")

Weight: 1.6 kg (3.5 lb)

Sensor Specifications (DOE-601 with DOE-601-SC)

Temperature Range: 0 to 40°C

(32 to 104°F)

Wetted Materials: PVC and FEP

Failure Alarm: 5 A SPDT relay closes if membrane is punctured, LED on panel is illuminated

Cable: Integral 8 m (26'); 300 m (1000') maximum distance to analyzer

Dimensions: 105.4 mm L (4.15"), 48 mm dia. (1.89")

Cartridge: DOE-601-SC, hermetically sealed

Mounting: $1\frac{1}{4}$ NPT

Mounting Hardware:

Floatation Mounting:

DOE-600-BFMK consists of ball float, extension pipe, swivel bracket, junction box and 15.5 m (50') of interconnect cable

Submersion Mounting:

DOE-600-SMK consists of 1.2 m (4') PVC pipe, junction box and 15.2 m (50') of interconnect cable

To Order

Model No.	Description
DOCN601	Dissolved oxygen controller, surface mount, 110 Vac
DOCN601-PM	Dissolved oxygen controller, panel mount, 110 Vac
DOCN601-PIPE	Dissolved oxygen controller, pipe mount, 110 Vac
DOCN602	Dissolved oxygen controller, 220 Vac
DOCN602-PM	Dissolved oxygen controller, panel mount, 220 Vac
DOCN602-PIPE	Dissolved oxygen controller, pipe mount, 220 Vac

Accessories

Model No.	Description
DOCN600-PM	DOCN600 panel mounting kit
DOCN600-PIPE	DOCN600 pipe mounting kit
DOE-601	$1\frac{1}{4}$ NPT mounting assembly and cable
DOE-601-SC	Hermetically sealed sensor cartridge
DOE-600-BFMK	Floatation mounting kit consists of ball float, extension pipe, swivel bracket, junction box and 15 m (50') of cable
DOE-600-SMK	Submersion mounting kit consists of 1.2 m (4') PVC pipe, junction box and 15 m (50') of cable

Comes complete with operator's manual.

Ordering Examples: DOCN601, surface mount DO controller, DOE-601, mounting assembly and cable, DOE-601-SC, sensor cartridge.

DOCN601-PM, panel mount DO controller, DOE-601, mounting assembly and cable, DOE-601-SC, sensor cartridge.