ECHOLINE®

LOW PRESSURE MONITOR



Prevents Unwanted Shutdown
High & Low Alarm Settings
UL 991

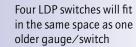


OVERVIEW

ECHOLINE® was designed in cooperation with a leading semiconductor manufacturer to prevent costly system shutdowns and reduce maintenance costs associated with low pressure monitoring of gas cabinet exhaust systems. ECHOLINE's Maintenance Mode feature prevents false alarms during system maintenance and balancing.

A customer defined time delay prevents
false trips which can cause system
shutdowns. "ECHO" (Electronic
Circuit Health Output)
diagnostics alert the user to
loss of external power or
internal electronics failure.
Four ECHOLINE® units fit
into the space of one old-

fashioned gauge/switch.



APPLICATIONS

STATIC PRESSURE APPLICATION ECHOLINE® FULL SCALE RANGES

| Gas Cylinder Cabinets | 1" to 5" WC |
|-----------------------------|---------------|
| Gas Isolation Box (GIB) | 1" to 5" WC |
| Mini Environments | 0.2" WC |
| Wet Bench & Wet Station | 0.5" to 1" WC |
| Chemical Dispensing | 0.5" to 1" WC |
| Diffusion Furnace Scavenger | 0.5" to 1" WC |
| Cleaning Hoods | 0.5" to 1" WC |
| Glove Boxes | 1" to 5" WC |
| Pump & Equipment Exhaust | 1" to 5" WC |
| Supplemental Exhaust | 0.5" to 1" WC |
| | |

ON/OFF

FEATURES



LED display of process and alarm state

Alarm status indicator

Front panel zero adjustment

Independently-set low and high set points

- Conformance to S2-0200 and CE, complies with the requirements of UL 991 and UL 508
- Latching relay output with adjustable time delay
- "Maintenance Mode" to prevent false trips during ventilation system balancing
- LED status indication
- Self-diagnostics
- Adjustable time delay to eliminate false trips and unwanted system shut down
- Optional selectable display of WC" or Pascal

Front cover cleanroom image courtesy of Pentagon Technologies.

SEMI S2-0200 SAFETY CONSIDERATIONS AND UL 991

ECHOLINE® was created using widely accepted best practices in an AS 9100 / ISO 9001 quality environment. Components used in the design and production of ECHOLINE® have been selected for their time proven performance, availability and reliability. ECHOLINE® contains no moving parts that can wear out, or microprocessors

that are susceptible to hidden software problems.

Centralized monitoring of multiple locations



When Used To Provide Safety Interlock, Monitor Ventilation Or Optimize Exhaust, ECHOLINE® Features:

- Discrete all analog electronic components no microprocessor
- Self-monitoring "ECHO" diagnostics
- Complies with the requirements of UL 991 and UL 508
- Fault tolerant design
- Maintenance mode
- User selected time delay
- Convenient interfacing with facility alarm system

When Used To Monitor Non- Critical Ventilation, ECHOLINE® Features:

- Maintenance mode to prevent false trips during ventilation system balancing
- Optional non-latching relay
- Bright LED display of process pressure

Operation

High and low limit alarms are independently set from the front panel. In normal operation, the LED display will indicate the sensed pressure and the High Limit/Low Limit LED status indicators will be green. When a preset limit is exceeded, the LED signals an alarm condition by turning red. After a customer selected time delay, the electromechanical relay contacts will be latched open and the LED display will flash the process pressure once every second. Manually depressing the reset button will cause the relay contacts to close if and when the process pressure is within set limits.

Maintenance Mode

The "Maintenance Mode" option is a unique and convenient safety feature which allows the user to widen the alarm set points during system maintenance. By closing terminal circuits 3 and 4, using a key switch or password protected computer, the user can expand the limits to 5% and 95% of the range to continue monitoring and prevent false trips. Opening terminal circuits 3 and 4 immediately returns the set points to the previous settings.

Time Delay

ECHOLINE® includes an adjustable "stand alone" time delay to prevent intermittent tripping due to brief transient upsets. When the unit senses a pressure outside the limits, the status LED will immediately turn red, but the relay will not open for a pre-selected time delay. The time delay will reset to zero if the process pressure returns to within the limits during the transient conditions. This feature provides a degree of "fault tolerance" for exhaust flow interlock applications. The time delay is field settable through a jumper located on the rear of the enclosure for 1, 10, 20 or 30 seconds.

ECHO Diagnostics

The ECHO function is an internal electronic check of certain circuit parameters. In the event of an internal failure, the ECHO output relay immediately opens to communicate the fault condition and the unit display goes blank. The electromechanical output relay has isolated contacts that monitor the circuit in real time.

SPECIFICATIONS

Indicating Pressure Ranges 0.2 to 20" WC (see model chart)

Display 3½ digit, 0.30" high red LED

Alarm Set Point Range Independently set high and low limits, 5 to 95% of

indicating range

ResetAlarm condition will remain until front panel reset button

is pressed, and pressure is within limits

Calibration Field adjustable zero via front panel screw adjustment

Accuracy 1% of range @ 20° C

Switch and ECHO Outputs Electro-mechanical relay, SPDT, Form A Dry Contacts

Relay Rating 1.0A @ 30 VDC, resistive

Status LEDs Green in normal state, red in alarm state

Time Delay 1, 10, 20, 30 seconds. Factory set at 10 seconds. Changeable

via rear panel jumper.

Analog Output (optional) 0-10 VDC or 4-20 mA, non-isolated, current sinking.

Maintenance Mode feature disabled.

Overpressure $\pm 14.5 \text{ psi (8" WC and above), } \pm 80" \text{ WC (under 8" WC)}$

Pressure Connection Push-to-connect fitting(s) for 0.25" O.D. tubing or dual

barbed fitting for 0.170" I.D. hose

Media Dry air, or inert non-conductive gas

Operating Ambient Temperature 0 to 40°C

Enclosure 1/16th DIN 43700, panel mounted polycarbonate, plastic

Wiring Plugable terminal block, 18-26 AWG, DSub (9 pin) connector

Weight 7 oz (200 g) maximum

Power 12-24 VDC, 1.4 Watts

APPROVALS



Conformance to S2-0200 SEMI standards

EN61326-1:1997 Electromagnetic compatibility

UL Recognized Component - Complies with the requirements of UL 991 and UL 508.

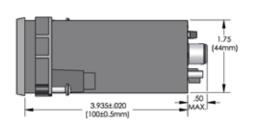
MODEL CHART

| Model | | Range / Units* | Minimum Set Pressure | Proof Pressure | Burst Pressure |
|---------|----|--------------------------|----------------------|----------------|----------------|
| LDP0.2 | WC | 0.2" x 0.001" WC | .002" WC | ± 80" WC | 120" WC |
| LDP0.5 | WC | 0-0.5" x 0.001" WC | 0.03" WC | ± 80" WC | 120" WC |
| LDP1 | WC | 0-1" x 0.01" WC | 0.05" WC | ± 80" WC | 120" WC |
| LDP2 | WC | 0-2" x 0.01" WC | 0.10" WC | ± 80" WC | 120" WC |
| LDP5 | WC | 0-5" x 0.01" WC | 0.3" WC | ± 80" WC | 120" WC |
| LDP10 | WC | 0-10" x 0.1" WC | 0.5" WC | ± 14.5 psig | 20 psig |
| LDP20 | WC | 0-20" x 0.1" WC | 1.0" WC | ± 14.5 psig | 20 psig |
| LDP100 | MW | 0-100 x 0.1 mm WC | 5 mm WC | ± 80" WC | 7 psig |
| | | | | | |
| LDP50 | Р | 0-50 Pascal x 0.1 Pascal | 3 Pa | ± 80" WC | 120" WC |
| LDP100 | Р | 0-100 Pascal x 1 Pascal | 5 Pa | ± 80" WC | 120" WC |
| LDP500 | Р | 0-500 Pascal x 1 Pascal | 25 Pa | ± 80" WC | 120" WC |
| LDP1000 | Р | 0-1000 Pascal x 1 Pascal | 50 Pa | ± 80" WC | 120" WC |
| LDP2000 | Р | 0-1999 Pascal x 1 Pascal | 100 Pa | ± 80" WC | 120" WC |
| LDP10 | KP | 0-10 KPa x 0.01 KPa | 0.50 KPa | ± 30 psig | 45 psig |

^{*} For user selectable scale (WC to Pa), consult factory

DIMENSIONAL DRAWINGS

Status LED 2 Places Set Point Adjust 2 Places



Optional Clear Watertight Cover



Optional Retrofit Mounting Plate

Back View Single Port Gage Pressure Jumper Selectable Process Alarm Time Delay on Break Push to Connect Fitting for 0.25" Outside Diameter Tube.

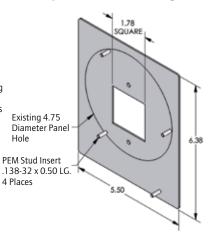
for Customer Wiring

18-26 AWG Wire Size

Back View Dual Port
Differential Pressure

Barbed Tube Fitting
for 0.170 I.D. Hose
(0.25 O.D.) 2 Places

9 Pin D-Sub
Connector
.1
4



^{*} For alternate units of measurement, consult factory

HOW TO ORDER

Create a part description by using the system below. The part description will follow this form. A drawing based on the part description will be submitted for user approval.

Setting Pressure Standard

Type Range — Connection Pressure Accessory Options

LDP 1 WC N M C M05

| | CODE | DESCRIPTION | LDP | 1WC | N M C MO5 |
|--------------|--|--|--|--|------------------------------|
| уре | | | | | |
| | LDP | Low Differential Pressure | 2 | | |
| etting Rang | | | | | |
| | Inches of Wa | ater Column | Pascal | | |
| | 0.2WC | 0 - 0.2" WC | 50 P | 0 - 50 Pascal | |
| | 0.5WC | 0 - 0.5" WC | 100 P | 0 - 100 Pascal | |
| | 1WC | 0 - 1" WC | 500 P | 0 - 500 Pascal | |
| | 2WC | 0 - 2" WC | 1000 P | 0 - 1000 Pascal | |
| | 5WC | 0 - 5" WC | 2000 P | 0 - 1999 Pascal | |
| | 10WC | 0 - 10" WC | 10 KPa | 0 - 10 KPa | |
| | 20WC | 0 - 20" WC | | | |
| | Millimeters | of Water Column | | | |
| | 100MW | 0 - 100 MW | | | |
| ressure Con | nnection ——— | | | | |
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| | | easing negative value as pres | | | |
| | incre P Sing | easing negative value as pres le push-to-connect for "Posit | ssure goes below atn ive" Pressure—Posit | | |
| | incre P Sing posit D Dual | easing negative value as pres le push-to-connect for "Posit tive value as pressure goes b | ssure goes below atn ive" Pressure—Posit elow atmospheric. al" Pressure—Differe | nospheric. | e increasing |
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The specified example denotes a 0 to 1" WC ECHOLINE® with a single "negative" pressure port, maintenance mode option, watertight cover and D Sub connector.



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