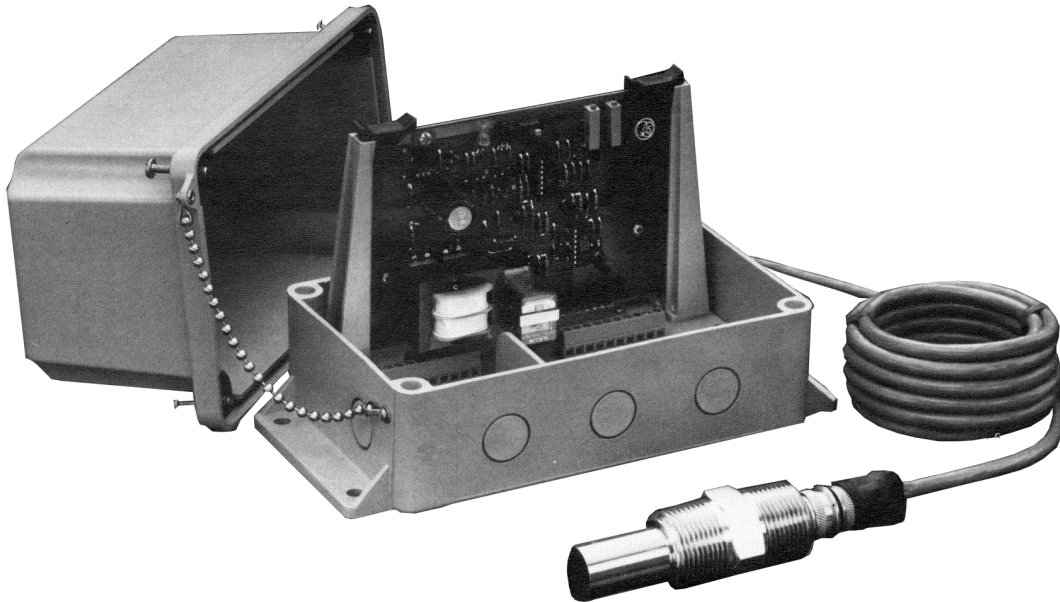




# SONAC®/120

# Liquid Level



## Function

Single Point Switch for On-Off Control of Liquid Level.

## Typical Uses

High Level Alarm or Control.  
Pump Control or Inlet Starvation Alarm.  
Flow/no Flow Indication.  
Low Level Alarm or Control.

## Primary Areas of Application

The Delavan SONAC®/120 is a reliable level control that will sense almost any liquid. Its failsafe features, insures positive level control in critical processes. The non-intrusive feature of its sensor permit its installation in extremely small vessels and pipes.

## Non-dedicated vessels

**The device senses virtually any liquid and does not need adjustment when the density or dielectric constants are changed.**

## High temperature, high pressure service

The welded, all stainless steel sensor body is designed for service at temperatures to 400°F (+205°C) and pressures to 2000 psig.

## Fluids with foam blankets

**The control ignores foam to sense the true liquid level.**

## Cryogenic fluids

**Series 26 sensors are designed for service at fluid temperatures to -425°F (-255°C).**

## Precision level control requirements

Repeatability to 0.050 in. standard.

## Features

### Autotest self-checking

**The unique self-checking feedback loop constantly "proves that the control is working properly and offers superior reliability in critical applications.**

### Really failsafe

**System is field adjusted to high or low level failsafe conditions (relay normal with power loss). The SONAC®/120 is designed so that any electrical or mechanical failure of Sensor or Component will cause the relay to transfer to the alarm mode.**

### Stable, dependable performance

This sensing technique provides a wet/dry ratio of 100:1 to provide dependable performance year in and out, without periodic adjustment.

### Corrosion resistant sensors

Standard sensor is 347 S.S. Optional models are available in Carpenter 20, Hastelloy C or 316 S.S.

### No false trips due to surge or spashing liquids

Non-integrating time delays reset until sensor remains wet or dry for the total time period desired.

### Corrosion resistant, watertight remote enclosure

Glass-reinforced polyester enclosure features captive hardware and stainless steel trim, to endure the most corrosive environments.

### Versatile power supply

The standard units are designed to accept 115 VAC, 230 VAC or low voltage DC input power.

## Principle of Operation

The sensor is a magnetostrictive device consisting of a diaphragm, nickel tube, magnet, drive coil and pickup coil. (see drawing, page 2).

When power is supplied to the drive coil, it causes the diaphragm to vibrate at a frequency determined by the mechanical resonant system of the sensor. Electrical energy is transferred to the pickup coil when the diaphragm is free to move in gas. When the diaphragm motion is loaded by a liquid, less energy is transferred to the pickup coil.

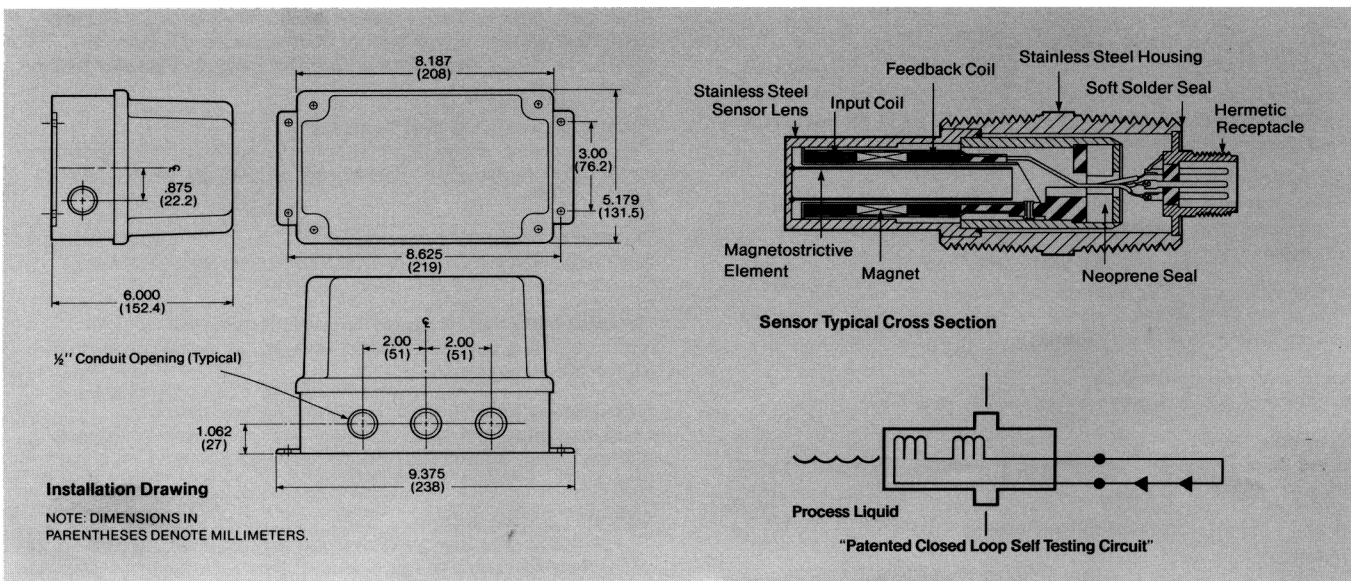
The pickup coil of the sensor is connected to the input of an amplifier and the output of the amplifier to the drive coil to form a feedback loop circuit. Any energy appearing in the output of the probe will be fed to the amplifier, amplified and returned to the input of the probe. This causes vibrations at 40 KHz to occur in the diaphragm and furnish a signal back to the amplifier for re-amplification. When the gain of the amplifier is adjusted so as to exceed the losses within the probe, continuous oscillations are produced.

If the diaphragm of the sensor is exposed to a liquid material, which offers greater mechanical resistance to the motion of the diaphragm, the transfer of energy to the pickup coil decreases. This results in a decrease in the signal feedback into the amplifier and a corresponding decrease in the signal available from the output of the amplifier. The decreased signal triggers a voltage sensitive network that controls the output relay.

A unique AUTOTEST self-checking circuit constantly verifies the integrity of the sensor circuits. If the frequency of the sensor circuits changes beyond a certain limit the RED LED will go out. If the change of state occurs due to a level change the relay will follow and change its state. However, if the change of state is due to a sensor failure or some other component failure, the relay will immediately de-energize to the alarm condition. This foolproof feature protects the system for loss of power, major component failure or damaged sensor conditions.

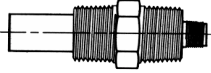
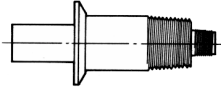
## Specifications Control Unit

Input Voltage	NOMINAL	ABSOLUTE LIMITS
	115 VAC	90-135 VAC
	230 VAC	180-270 VAC
	24 VDC	±4 V
<b>Power</b>	3 VA	
<b>Frequency, AC Power</b>	50-60 Hz	
<b>Time Delay</b>	Adjustable non-integrating on wet, dry	
<b>Delay Time Range</b>	50 m Sec. Min. - 10 Sec.Min. Long Delay, 30 Sec. Max	
<b>Failsafe</b>	<ul style="list-style-type: none"> <li>• Switch selectable - High Level or Low Level.</li> <li>• High Level Failsafe Position: Relay is de-energized when product is present. (wet)</li> <li>• Low Level Failsafe Position: Relay is de-energized when product is not present. (dry)</li> </ul>	
<b>Indicators</b>	Two, light emitting diodes (LED). YELLOW - illuminated when relay is energized. RED - illuminated when product is absent at sensor.	
<b>Operating Temperature</b>	-40° to 160°F (-40° to 71°C)	
<b>Output</b>	Relay, DPDT Form C	
<b>Ratings</b>	5 A at 120 VAC Resistive 3 A at 240 VAC Resistive 3 A at 24 VDC Resistive	
<b>Maximum Cable Length</b>	PVC, 100 feet (30.5M) Teflon, 60 feet (18.3M)	
<b>Shipping Weight</b>	Control Unit 5 pounds (2.25 kilograms) Sensor 1.5 pounds (0.68 kilogram) Cable 0.5 pounds (0.45 kilogram)	

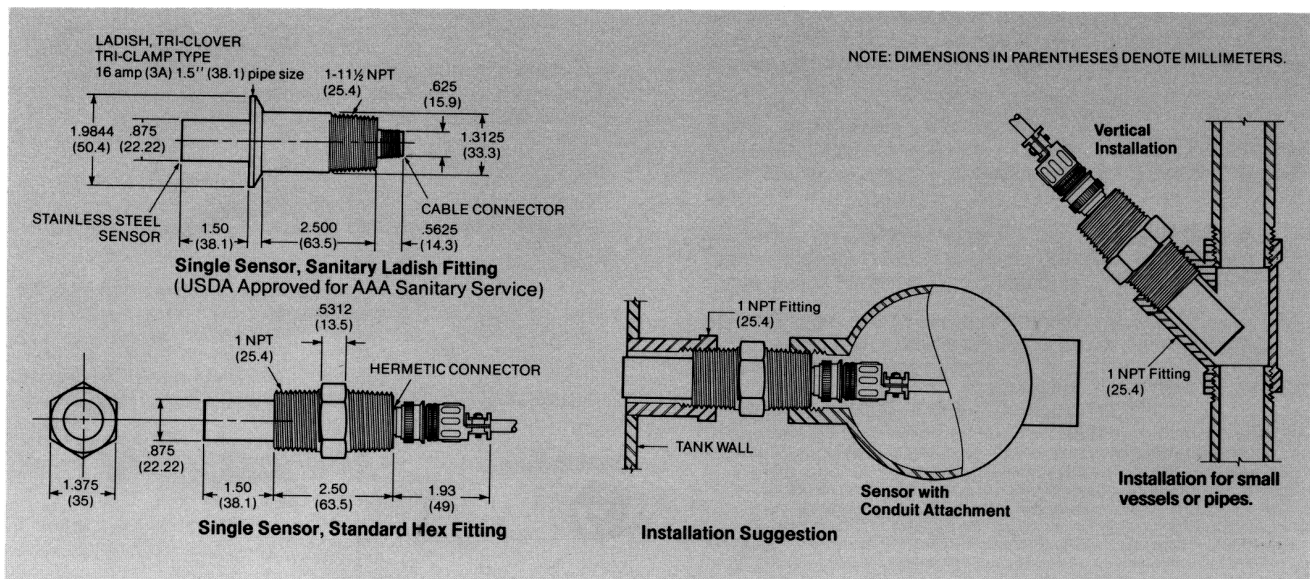




## Specifications Sensor

Sensor	Model No.	Type	Description
*Also available in these materials or coatings: Carpenter 20 Gold plated Epoxy coated Hastelloy "C" 316 S.S.	21*	General Purpose	347 Stainless Steel Temp. Range: -65°F to +220°F (-54°C to +104°C) Pressure: 2000 psi
	22*	High Temperature	347 Stainless Steel Temp. Range: -65°F to +400°F (-54°C to +204°C) Pressure: 2000 psi
	24	General Purpose Sintered Teflon Coated for non-stick	347 Stainless Steel Temp. Range: -65°F to +220°F (-54°C to +104°C) Pressure: 2000 psi
	25	High Temperature - Sintered Teflon Coated for non-stick	347 Stainless Steel Temp. Range: -65°F to +400°F (-54°C to +204°C) Pressure: 2000 psi
	26	Low Temperature Cryogenic	347 Stainless Steel Temp. Range: -425°F to +220°F (-225°C to +104°C) Pressure: 2000 psi
	28	Sanitary - Ladish Fitting (USDA Approval for AAA Sanitary Service)	347 Stainless Steel Temp. Range: -65°F to +220°F (-54°C to +104°C) Pressure: 2000 psi

Type Analysis	C	Mn	P	S	Si	Cr	Ni	Other Elements
347 Stainless Steel	0.08%	2.00%	0.045%	0.030%	1.00%	17.00/19.00%	9.00/13.00%	Cb-Ta 10 x C min.
316 Stainless Steel	0.08%	2.00%	0.045%	0.030%	1.00%	16.00/18.00%	10.00/14.00%	



**Sensor Cable Assemblies and Accessories**

Cable Part No.	Type	Description
23273	High Temperature	10 ft. Teflon Cable Assembly - Temp Range: Recommended if temp. will exceed 200°F(93°C) used with sensors #22, #23, #25, #26, #27
23274	High Temperature	30 ft. Teflon Cable Assembly - Temp Range: Recommended if temp. will exceed 200°F(93°C) used with sensors #22, #23, #25, #26, #27
23275	High Temperature	60 ft. Teflon Cable Assembly - Temp Range: Recommended if temp. will exceed 200°F(93°C) used with sensors #22, #23, #25, #26, #27
23276	General Purpose	10 ft. PVC Cable Assembly - Used with sensors #21, #24, #28
23277	General Purpose	50 ft. PVC Cable Assembly - Used with sensors #21, #24, #28
23278	General Purpose	100 ft. PVC Cable Assembly - Used with sensors #21, #24, #28
12667	General Purpose	Bulk PVC Cable
17198	High Temperature	Bulk Teflon Cable
11904	—	Female Shielded Cable Connector (for cable splicing)

**Ordering Information Specify:**

Amplifier  
 Cable Assembly P/N  
 Sensor Model

**Customer Connections  
 SONAC/120**

<b>GND.</b>	<b>NEUT</b>	<b>115 VAC</b>	<b>230 VAC</b>	<b>NC</b>	<b>C</b>	<b>NO</b>	<b>NC</b>	<b>C</b>	<b>NO</b>	<b>SENSOR BLACK</b>		<b>+</b>	<b>-</b>		<b>SENSOR SHIELD</b>		<b>LOW VOLT INPUT</b>			<b>SENSOR WHITE</b>
<b>RELAY CONTACTS</b>																				
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	

**TWO-YEAR PRODUCT WARRANTY**

Delavan Inc. control products will be replaced, put in good operating condition, or the purchase price refunded, at the option of Delavan Inc., free of charges except transportation, if defective in their manufacture, labeling, packaging, or shipping, and if notice of said defect is received by Delavan Inc. within two years from the date of shipment. The cost of such replacement, repair or refund or purchase price shall be the exclusive remedy for any breach of any warranty, and Delavan Inc. shall not be liable to any person for consequential damages for injury or commercial loss resulting from any breach on any warranty. Delavan Inc. makes no warranty of fitness for a particular purpose, and makes no other warranty, express or implied, including implied warranty arising from course of dealing or usage of trade.



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