Echotel® Model 919 Ultrasonic Level Switch

DESCRIPTION

Echotel Model 919 ultrasonic level switches are compact integral units that perform high or low level measurement in a variety of liquid applications. Pulsed signal technology allows the 919 to excel in difficult application conditions that may cause other ultrasonic switches to fail; and provides excellent immunity from electrical noise that is common in many industrial applications.

The Model 919 is available with two different electronics, both of which are housed in a watertight, corrosion resistant Valox® enclosure. The 24 VDC unit features a 3 amp SPDT relay output. An all-voltage version is also available that operates from 24 to 240 volts AC or DC.

The tip sensitive 316 SS transducer can be mounted horizontally or vertically, and is available in a wide variety of process connections. A sanitary transducer option has 3-A authorization, a 20 R_a surface finish, and a unique crevice-free sensor tip that enhances cleanability during the CIP process.

Model 919
with ¾" NPT

Model 919
with sanitary fitting

FEATURES

- Watertight, corrosion resistant Valox housing
- Sanitary transducer with 20 R_a finish and 3-A authorization
- No calibration required
- 316 stainless steel tip sensitive transducer
- Rotatable housing for easy conduit alignment
- Mounting options include ¾" NPT, 1" NPT or 1" BSP, and a variety of ASME and sanitary flange configurations
- High performance ultrasonic pulsed signal technology

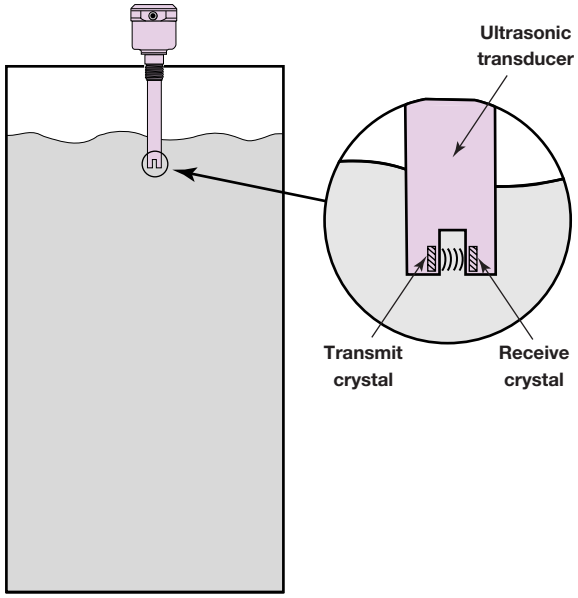
APPLICATIONS

- Water and wastewater
- High or low liquid level alarm
- Overfill protection
- Generic chemicals
- Food and beverage products
- Pharmeceuticals
- Bioengineering
- Pump protection
- OEM integration with skids, compressors, and pump platforms

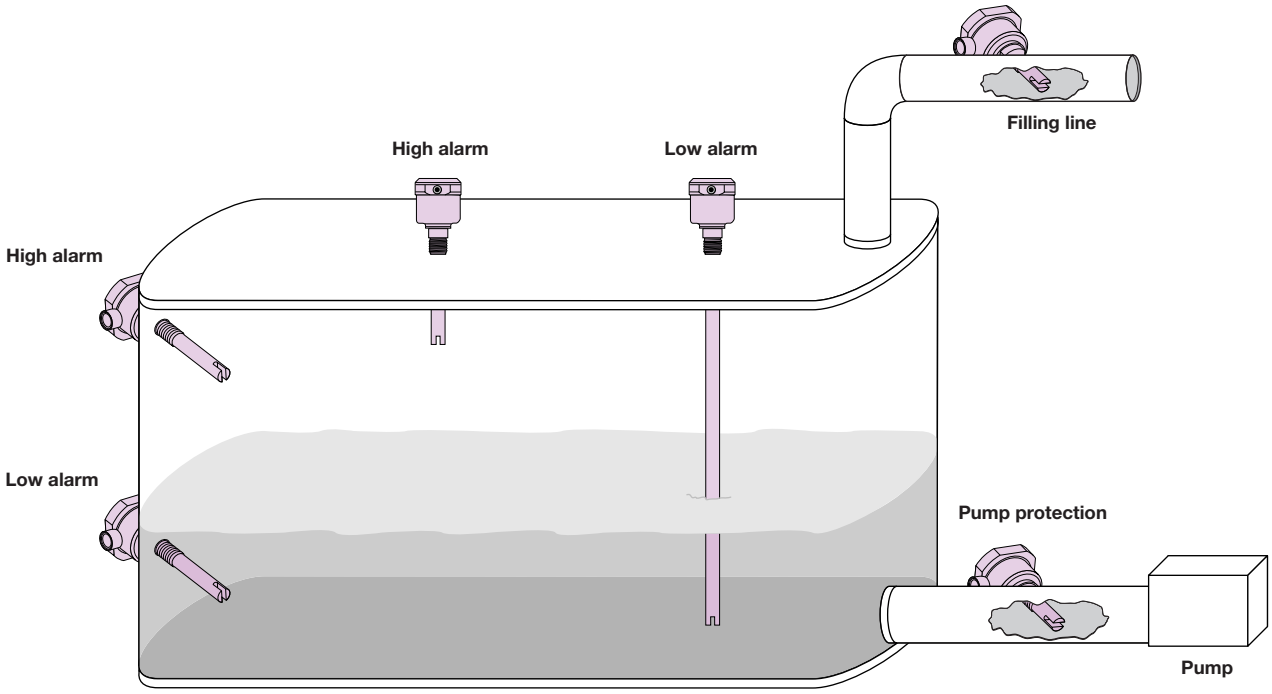
TECHNOLOGY

The Model 919 Level Switch uses ultrasonic energy to detect the presence or absence of liquid in a 316 SS tip sensitive transducer. The principle behind ultrasonic contact technology is that high-frequency sound waves are easily transmitted across a transducer gap in the presence of liquid, but are attenuated when the gap is dry. The Model 919 uses this ultrasonic technology to perform liquid level measurement in a wide variety of process media and application conditions.

The transducer uses a pair of piezoelectric crystals that are encapsulated in epoxy at the tip of the transducer. The crystals are made of a ceramic material, that vibrates at a given frequency when subjected to an applied voltage. The transmit crystal converts the applied voltage from the electronics into an ultrasonic signal. When liquid is present in the gap, the receive crystal is able to sense the ultrasonic signal from the transmit crystal and convert it back to an electrical signal. This signal is sent to the electronics to indicate the presence of liquid in the transducer gap. When there is no liquid present, the ultrasonic signal is attenuated, and is not detected by the receive crystal.



Ultrasonic signal transmission across gap

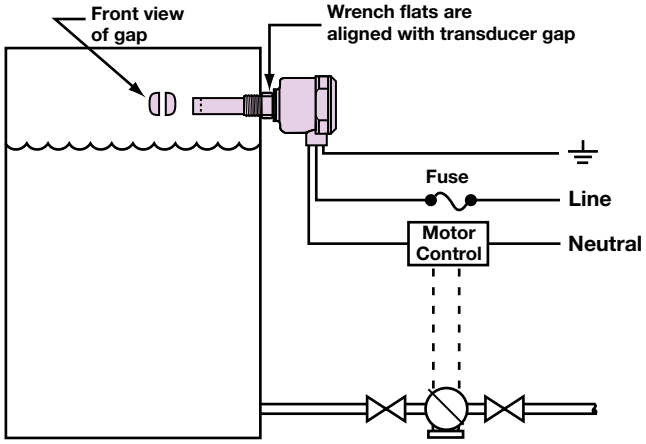


Typical applications and mounting positions

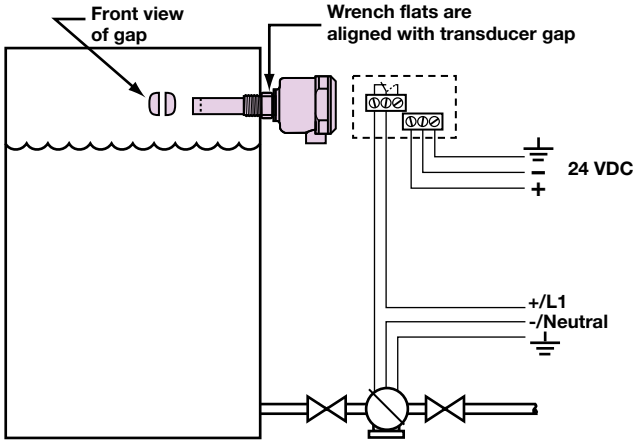
SWITCH OPERATION

The all-voltage version of the Model 919 controls the flow of current to a connected load. An AC or DC voltage ranging from 24 to 240 volts may be applied to the 919 switch. The load is connected in series with the 919 electronics. When liquid is present in the transducer gap, a MOSFET switch is closed, thus providing current flow (power) to the load. When liquid is no longer present, the MOSFET switch is opened and power is no longer supplied to the load.

The relay version of the Model 919 features a 3 amp SPDT relay that can be configured for high or low level failsafe. Input power to the relay version is 24 VDC.

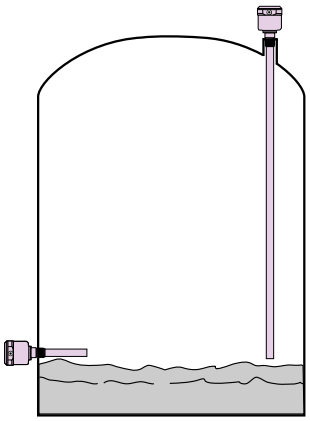


Typical Model 919 all voltage unit wiring



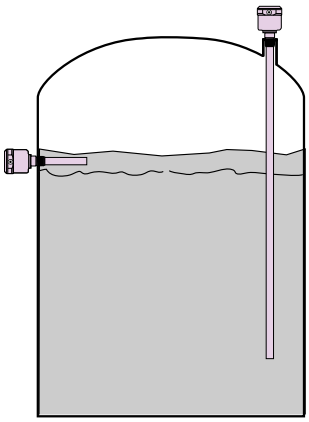
Typical Model 919 relay unit wiring

A two-position DIP switch is used to select high level or low level failsafe. The relay version has a selection of HL for high level failsafe, or LL for low level failsafe. The all-voltage version has a selection DRY-ON for high level failsafe, or WET-ON for low level failsafe.



Low Level Measurement

919 Version	DIP switch
Relay	LL
All-Voltage	WET-ON



High Level Measurement

919 Version	DIP switch
Relay	HL
All-Voltage	DRY-ON

AGENCY APPROVALS

MODEL NUMBERS	RATING
919-XXXX-XXX	NEMA 4X (IP67)
919-XXS3-XXX & 919-XXS4-XXX	3-A (Authorization #596)

CE These units have been tested to EN 50081-2 and EN 50082-2 and are in compliance with the EMC Directive 89/336/EEC.

SWITCH SPECIFICATIONS

ELECTRICAL

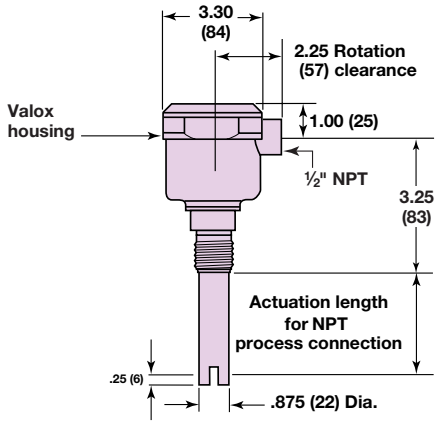
Power Supply:	All Voltage:	24-240 VAC ± 10% 50-60 Hz (load always required)
		24-240 VDC ± 10% (load always required)
	Relay:	24 VDC (±10%)
Power Consumption:	All Voltage:	0.1 VA maximum
	Relay:	Less than 1 Watt
Signal Output:	All Voltage:	500 mA (continuous) max., 7.5 mA (continuous) min. load
	Relay:	SPDT 3 amp @ 30 VDC resistive and 3 amp @ 125 VAC resistive
Repeatability:		0.078'' (2 millimeters)
Response Time:		½ second typical

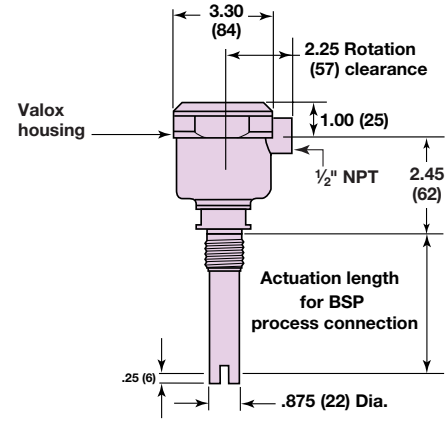
ENVIRONMENTAL

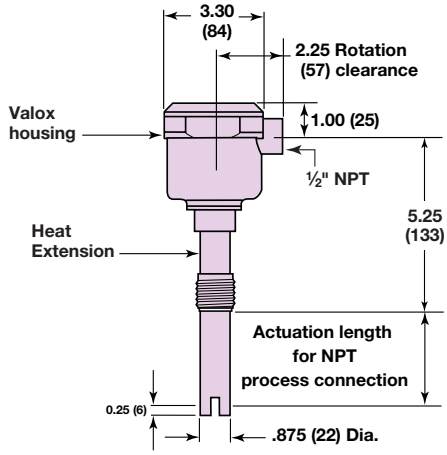
Ambient Temperature:	Electronics: -40° to +160° F (-40° to +70° C)
Process Pressure:	1500 psig (103 bar) maximum
Process Temperature:	Without heat extension: -40° to +250° F (-40° to +120° C)
	With heat extension: -40° to +300° F (-40° to +150° C)
Housing Material:	Valox® (PBT)
Ingress Protection:	NEMA 4X (IP67)
Shock	ANSI/ISA-S71.03 Class SA1
Vibration	ANSI/ISA-S71.03 Class VC2

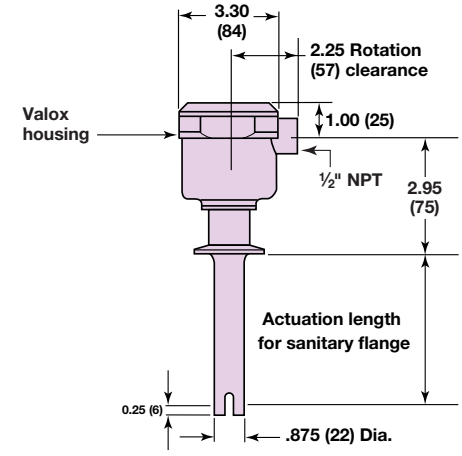
DIMENSIONS

INCHES (MM)









SWITCH

MODEL NUMBER

Models available for quick shipment, usually within one week after factory receipt of a purchase order, through the Expedite Ship Plan (ESP).

OUTPUT AND HOUSING

C	All voltage version with single PG 13.5 conduit connection
F	All voltage version with single ½" NPT conduit connection
M	Relay version with single PG 13.5 conduit connection
R	Relay version with single ½" NPT conduit connection

UNIT VERSION

0	English (actuation length in inches)
1	Metric (actuation length in centimeters)
G	English (actuation length in inches) with heat extension
H	Metric (actuation length in cm) with heat extension

TRANSDUCER MATERIAL

2	316/316L stainless steel
S	316/316L stainless steel w/20 R_a sanitary finish

PROCESS CONNECTION

1	¾" NPT
2	1" NPT
3	1½" sanitary fitting, 16 AMP
4	2" sanitary fitting, 16 AMP
9	1" BSP
B	1" 150 lb. ASME flange
D	2" 150 lb. ASME flange

ACTUATION LENGTH ① ② ③

1 to 130 inches in 1 inch increments Example: 4 inches = 004
3 to 330 centimeters in 1 centimeter increments Example: 6 centimeters = 006
Available ESP lengths: 1", 4", 6"

① 1" (3 cm) minimum with NPT threaded process connections.
2" (5 cm) minimum with ASME flange, sanitary fitting, or BSP process connections

② Consult factory for longer lengths

③ Consult factory for metric length codes available for ESP

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QUALITY

MAGNETROL
REGISTERED TO
ISO 9001
Your Assurance of
Quality and Service

The quality assurance system in place at Magnetrol guarantees the highest level of quality throughout the company. Magnetrol is committed to providing full customer satisfaction both in quality products and quality service.

Magnetrol's quality assurance system is registered to ISO 9001 affirming its commitment to known international quality standards providing the strongest assurance of product/service quality available.

ESP

Expedite
Ship
Plan

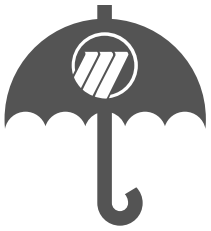
Several Echotel Model 919 Ultrasonic Level Switches are available for quick shipment, usually within one week after factory receipt of a purchase order, through the Expedite Ship Plan (ESP).

Models covered by ESP service are conveniently color coded in the selection data charts.

To take advantage of ESP, simply match the color coded model number codes (standard dimensions apply).

ESP service may not apply to orders of ten units or more. Contact your local representative for lead times on larger volume orders, as well as other products and options.

WARRANTY



All Magnetrol electronic level and flow controls are warranted free of defects in materials or workmanship for one full year from the date of original factory shipment.

If returned within the warranty period; and, upon factory inspection of the control, the cause of the claim is determined to be covered under the warranty; then, Magnetrol will repair or replace the control at no cost to the purchaser (or owner) other than transportation.

Magnetrol shall not be liable for misapplication, labor claims, direct or consequential damage or expense arising from the installation or use of equipment. There are no other warranties expressed or implied, except special written warranties covering some Magnetrol products.

For additional information, see Instruction Manual 51-627

Magnetrol

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