



Echotel® Model 911/921 Ultrasonic Level Switches

DESCRIPTION

Echotel Model 911/921 ultrasonic level switches sense the presence or absence of liquids in a transducer gap by utilizing continuous wave ultrasonic technology. These units are suitable for clean liquid applications having low viscosity, low aeration and a low percent of solids. The measurement is not affected by shifts of specific gravity or conductivity.

FEATURES

- Single or dual point
- Integral or remote mount
- Local and remote self-test
- Requires no calibration
- FM and CSA hazardous area approvals
- Actuation lengths to 130 inches (3.3 meters)
- Choice of electronics housings include NEMA 4X or NEMA 4X/7/9
- NEMA 7/9 transducer housing for remote mount applications
- Input power: 120 VAC, 50/60 Hz, 240 VAC 50/60 Hz, 24 VDC, 12 VDC
- Output includes a 10 amp DPDT or 5 amp DPDT hermetically sealed relay, TTL, and open collector
- Choice of transducer materials: 316 stainless steel, CPVC, Hastelloy B or C, Kynar, Monel, Polypropylene, Teflon®
- Adjustable time delay compensates for splashing or turbulence of the process fluid



**Model 921 with dual gap transducer
and NEMA 4X housing**

APPLICATIONS

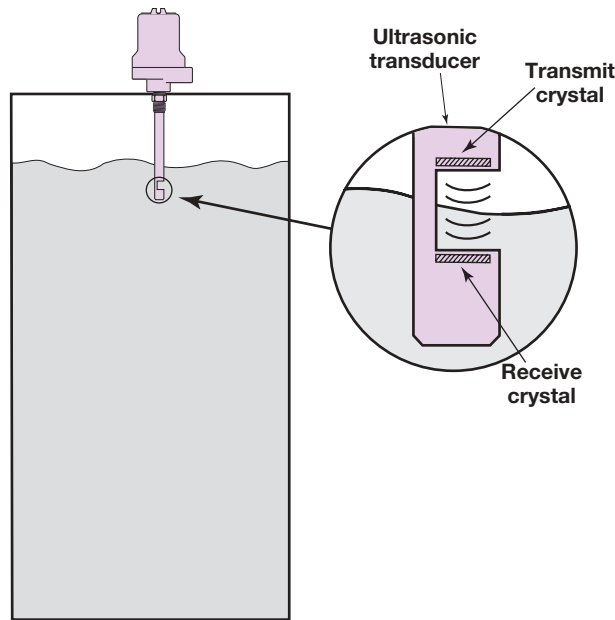
- Clean liquids
- Light viscous liquids
- Low % solid in liquids
- Corrosive liquids
- Storage tanks
- Sumps
- Separators
- Accumulators
- Receivers
- Scrubbers
- Knock out drums
- Drip traps

TECHNOLOGY

Model 911/921 level switches use ultrasonic energy to detect the presence or absence of liquid in a side gap 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 911/921 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 in the transducer gap. 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.



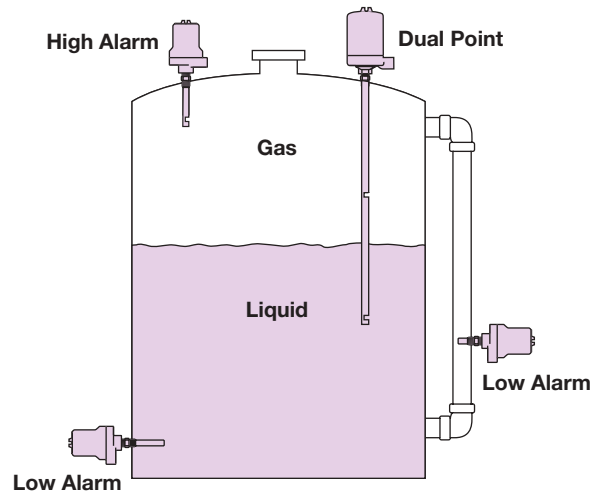
**Ultrasonic signal transmission
across gap**

TYPICAL APPLICATIONS



Model 911/921 switches may be used for high or low level alarm, as well as for pump protection.

The single point 911 can be mounted vertically or horizontally in vessels, bridles, or pipes. The dual gap 921 is always top mounted.


A broad selection of metallic and thermoplastic transducer materials allows the 911/921 to be used in a wide variety of industrial and municipal applications.



AGENCY APPROVALS

AGENCY	MODEL APPROVED	AREA CLASSIFICATION
FM  APPROVED	9X1-XXXX-A1X	NEMA 4X
	9X1-XXXX-E1X 9X1-XXXX-F1X	Class I, II, III, Div. 1; Groups C, D, E, F, & G NEMA 4X
	9X1-XXXX-H1X with transducer ① 58X-1AXX-XXX	Class I, II, III, Div. 1; Groups B, C, D, E, F, & G NEMA 4X
CSA 	9X1-A1AX-A1X 9X1-B1CX-A1X	TYPE 4X
	9X1-XXXX-E1X 9X1-XXXX-F1X	Class I, II, III, Div. 1; Groups C, D, E, F, & G TYPE 4X
	9X1-A1AX-H10 9X1-B1CX-H10 with transducers ② 58X-1A22-XXX 58X-1AHB-XXX 58X-1AHC-XXX 58X-1AMM-XXX	Class I, II, III, Div. 1; Groups B, C, D, E, F, & G TYPE 4X

① All transducer materials approved except polypropylene
 ② All transducer materials approved except CPVC, teflon, kynar, and polypropylene

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

SPECIFICATIONS

ELECTRICAL

Power supply	120 VAC, 50/60 Hz (+10%/-15%) 240 VAC, 50/60 Hz (+10%/-15%) 24 VDC (±10%) 12 VDC (±10%)
Output Signal Options	Gold Flash relay, DPDT 10 amps @ 120/240 VAC or 24 VDC Hermetic relay, DPDT 5 amps @ 120/240 VAC or 24 VDC TTL ^① 1 TTL load Open collector ^① VCE max: 40 VDC, Power max: 300 mw
Power consumption	2.5 VA nominal
Repeatability	0.078" (1.98 mm)
Fail-safe	Field selectable high or low
Time delay	0 – 60 seconds nominal
Self test	Local magnetic Remote electrical by push button
Calibration	Not required
Ambient temperature	-40° to +160° F (-40° to +71° C)

① Self-test feature not available. Consult factory for additional information.

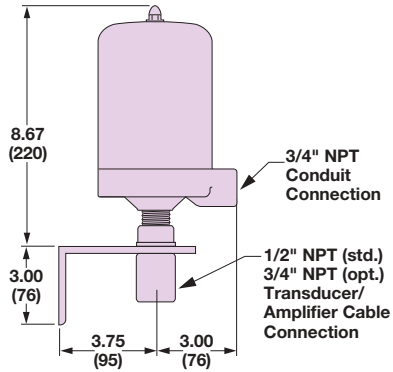
SPECIFICATIONS

TRANSDUCER

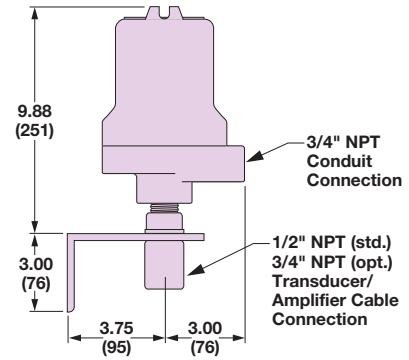
Material (Code)	Operating Temperature Range	Maximum Operating Pressure	Minimum/Maximum Actuation Length	Available With Model:
316 Stainless Steel (22)	-40° to +250° F (-40° to +121° C)	800 PSIG (55 bar)	1"/130"	911 & 921
Hastelloy B (HB)	-40° to +250° F (-40° to +121° C)	800 PSIG (55 bar)	1"/130"	911 & 921
Hastelloy C (HC)	-40° to +250° F (-40° to +121° C)	800 PSIG (55 bar)	1"/130"	911 & 921
Monel (MM)	-40° to +250° F (-40° to +121° C)	800 PSIG (55 bar)	1"/130"	911 & 921
CPVC (CC)	-40° to +250° F (-40° to +121° C)	100 PSIG (7 bar)	1"/130"	911 & 921
Polypropylene (YY)	-40° to +250° F (-40° to +121° C)	100 PSIG (7 bar)	1"/130"	911 Only
Kynar (KK)	+32° to +250° F (0° to +121° C)	100 PSIG (7 bar)	1"/130"	911 Only
Teflon (FF)	+0° to +250° F (-18° C to +121° C)	100 PSIG (7 bar)	1"/48"	911 Only

DIMENSIONAL SPECIFICATIONS

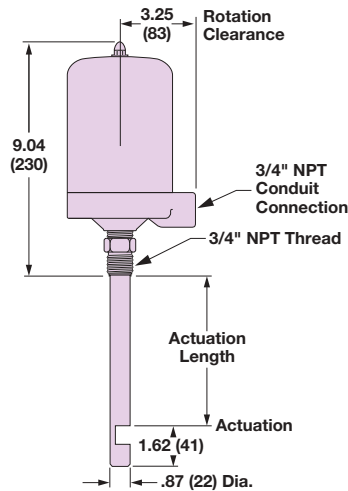
INCHES (MM)



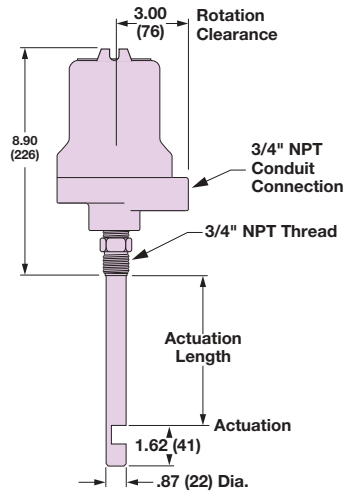
**Model 911 and 921 Remote Mount
with NEMA 4X Carbon Steel Housing
(Housing Code A)**



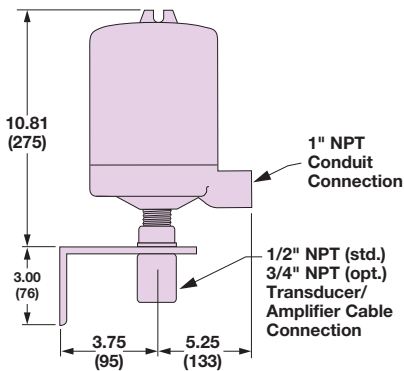
**Model 911 Remote Mount
with NEMA 4X/7/9 Cast Aluminum Housing
(Housing Code E)**



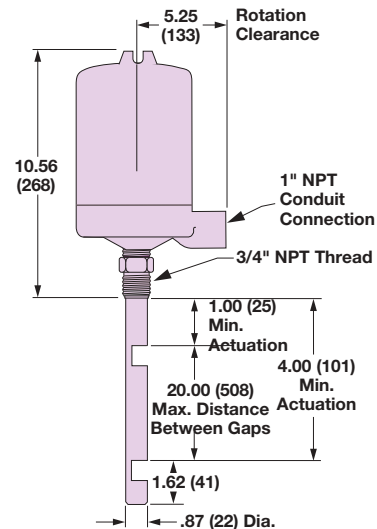
**Model 911 Integral Mount
with NEMA 4X Carbon Steel Housing
(Housing Code A)**



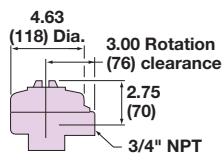
**Model 911 Integral Mount
with NEMA 4X/7/9 Cast Aluminum Housing
(Housing Code E)**



**Model 921 Remote Mount
with NEMA 4X/7/9 Cast Iron Housing
(Housing Code H or F)**



**Model 921 Integral Mount
with NEMA 4X/7/9 Cast Iron Housing
(Housing Code H or F)**



Remote Transducer Housing

TRANSDUCER MODEL NUMBER

SET POINTS

1	Single gap transducer
2	Dual gap transducer

PROCESS CONNECTION

1A	3/4" NPT
----	----------

TRANSDUCER MATERIALS

22	316 stainless steel
HB	Hastelloy B
HC	Hastelloy C
MM	Monel
CC	CPVC
YY	Polypropylene
KK	Kynar
FF	Teflon (maximum actuation length = 48")

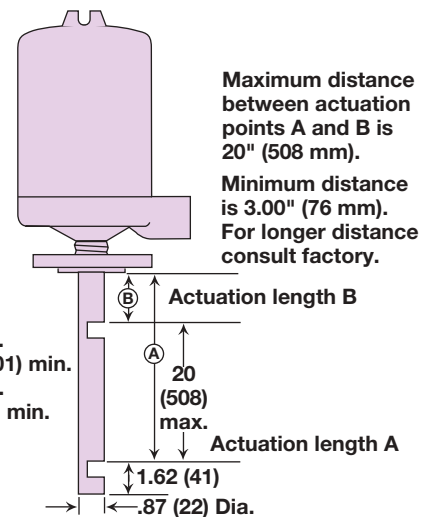
ACTUATION LENGTH (INCHES)

Single point transducer:
1 to 130 inches in 1 inch increments
Example: 4 inches = 004

Available ESP lengths: 1", 3", 4", 6", 8", 10", 12"

Dual point transducer:
4 to 130 inches in 1 inch increments
Example: For a dual point unit with actuation points at 7" and 18", specify code 018 and "B" dimension = 7".
If the gaps are more than 20" apart, consult factory.

NOTES:
Use the "A" dimension from drawing below as actuation length. The "B" dimension must also be specified.



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 911/921 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 51-601



5300 Belmont Road • Downers Grove, Illinois 60515-4499 • 630-969-4000 • Fax 630-969-9489 • www.magnetrol.com
145 Jardin Drive, Units 1 & 2 • Concord, Ontario Canada L4K 1X7 • 905-738-9600 • Fax 905-738-1306
Heikenstraat 6 • B 9240 Zele, Belgium • 052 45.11.11 • Telex 25944 • Fax 052 45.09.93
Regent Business Ctr., Jubilee Rd. • Burgess Hill, Sussex RH15 9TL U.K. • 01444-871313 • Fax 01444-871317

Copyright © 2004 Magnetrol International, Incorporated. All rights reserved. Printed in the USA.
Magnetrol and Magnetrol logotype are registered trademarks of Magnetrol International.

Performance specifications are effective with date of issue and are subject to change without notice.
The brand and product names contained within this document are trademarks or registered trademarks of their respective holders.

BULLETIN: 51-102.13
EFFECTIVE: January 2004
SUPERSEDES: February 2002