



Description

General Description

The **ULS-11/20 Series Liquid Level Detection System** is an ideal, low cost, ultrasonic liquid level detection system for many applications. It operates in a broad spectrum of viscous to light liquids.

Principle of Operation

The **ULS-11/20 Series** operates using ultrasonic sound wave propagation. Ultrasonic sound waves are greatly attenuated when transmitted through air. Conversely, when liquid is present, transmission of the sound waves is greatly enhanced. The electronic control unit generates electrical signals that are converted to bursts of ultrasonic energy at the sensor. The ultrasonic bursts are transmitted across the liquid sensing gap. Upon receipt of a valid signal, the solid-state electronics generate a ***data enable*** condition, indicating liquid is present. This signal energizes a relay to provide a contact closure.

Model Description

GEMS Model No.	Mounting Type	Input Power	Output (Relay)	Function
ULS-11	Integral	9 - 42 VDC	1 Amp N.O. or N.C.	Level
ULS-20	Integral	120/240 VAC	10 Amp N.O. or N.C.	Level

Notes:

1. Standard sensor for contact type point level: 316 stainless steel.
2. 3/4" NPT is standard, different NPT and flanges are optional.
3. Standard length of sensor is 2.5". Extension up to 99" is available.

Installation

General

The unit is easy to install. The sensor, with its integral electronics control unit, can be mounted in any position or orientation desired.

Make sure that all wiring, conduit and electrical fittings conform to local Electrical Codes for the location selected.

Visual Inspection

Unpack the control unit and sensor assemblies. Visually inspect them for any damage. **Advise Factory immediately if either assembly is damaged.**

Preliminary Operational Check

Before installing the unit, a simple operational check-out should be performed:

1. Fill a container with liquid.

WARNING: In a hazardous environment, never open housing cover or connect power leads without first disconnecting electrical power at the source.

2. See wiring diagram for making the proper wiring connections. (9 to 42 VDC)
3. Apply power from the source.
4. Place the sensor in the liquid. Relay should energize.
5. Remove sensor from the liquid. Relay will deenergize. System is functioning properly.
6. Disconnect power to the control unit.
7. Proceed to final installation.

If the system does not function, notify the Factory immediately.

Final Installation

Invasive Contact Type

Follow the instructions below:

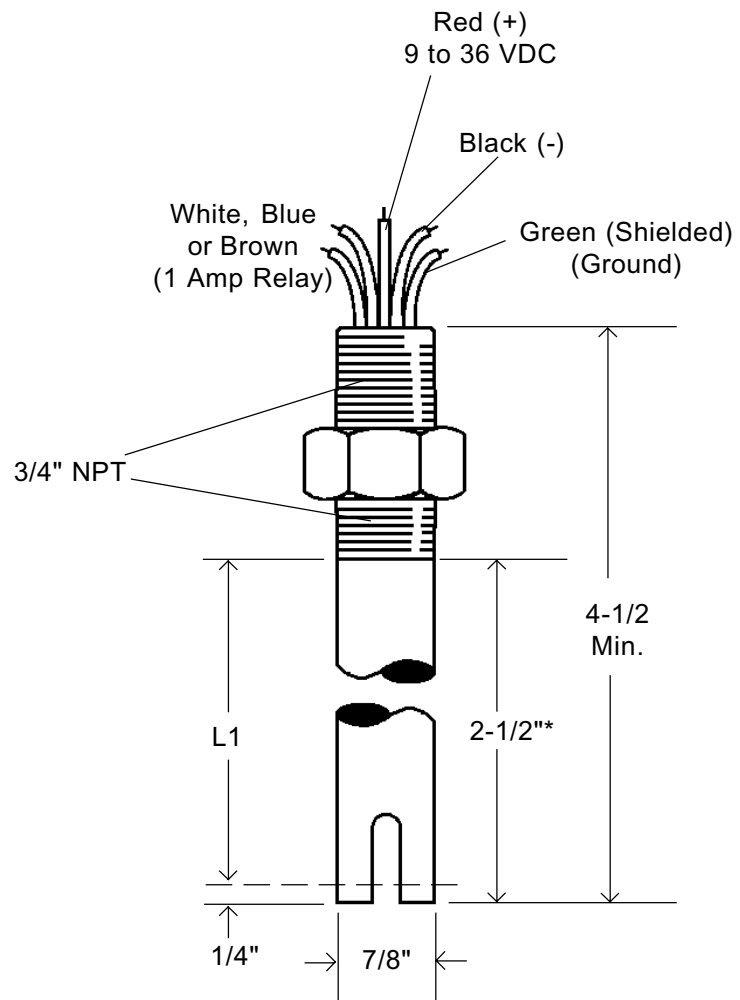
1. Drill a suitable hole in the vessel or pipe wall and tap for 3/4" NPT. In thin walled vessel or material not suitable for threading, weld or braze a bushing to accept the sensor.
2. Screw the sensor in the threaded section and make sure that there is a good seal. Use a pipe compound or sealing tape to avoid excessive tightening. Do not overtighten.
3. Run the power and control wiring cables to the electronics control unit.

Observe all applicable electrical codes and proper wiring procedures.

Wiring Diagram Model ULS-11

Wiring Color Code

1. Power
Red (+)
Black (-)
2. Relay
COM = White
N.O. = Blue
N.C. = Brown
3. Ground
Green
Shield



System Wiring Diagram

ULS-11 Series Ultrasonic Level Sensor

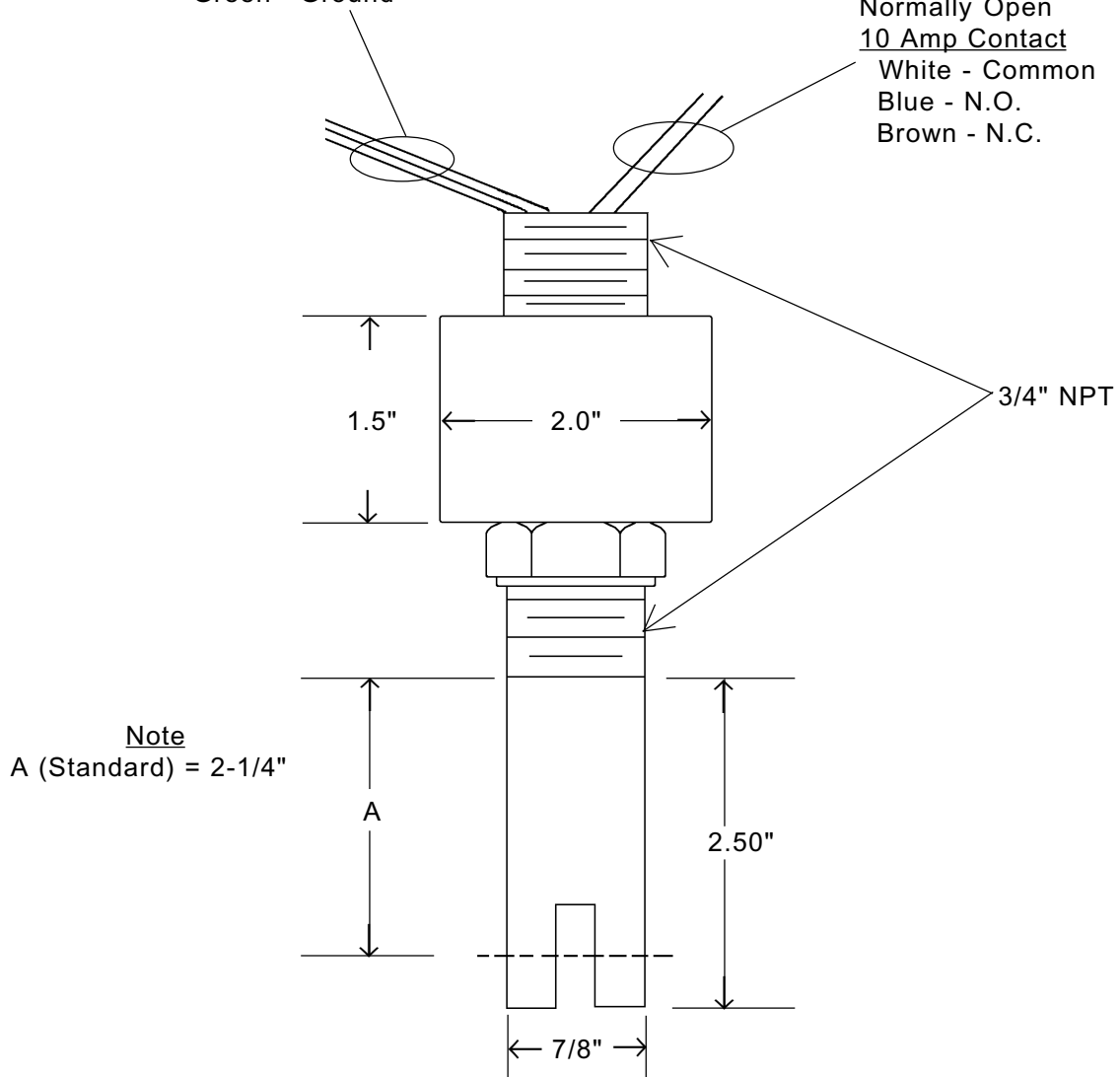
(P/N 140197)

115 VAC, 50 Hz

3-Conductor Cable:

Black - Hot
 White - Neutral
 Green - Ground

Normally Open
10 Amp Contact
 White - Common
 Blue - N.O.
 Brown - N.C.

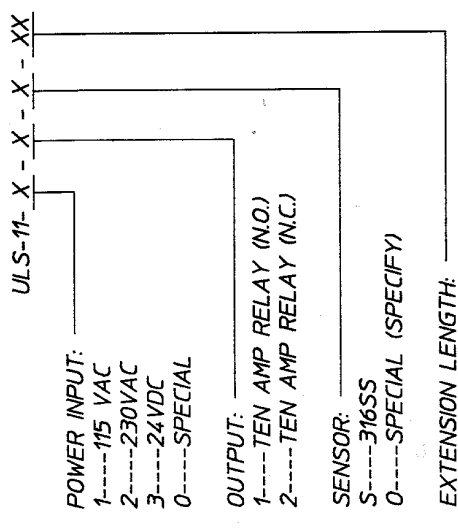
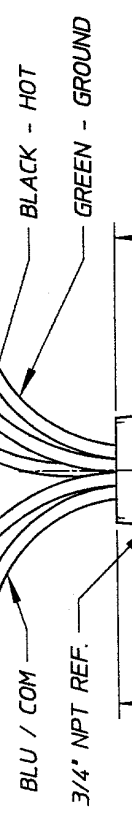


Note
 A (Standard) = 2-1/4"

Note

Material: 316 SS. Call Factory for special size, material, extension length.

ORN / N.C. OR YEL / N.O. BLU / COM 3/4" NPT REF.	PROPRITARY NOTICE THIS DOCUMENT AND ITS DATA ARE UNCLASSIFIED UNLESS INDICATED OTHERWISE IN THIS DOCUMENT DATE 12/10/98 BY 60321/UC/STW	DWG. NO. 163214	REV.	REVISIONS			
				CDN.	LTR.	DESCRIPTION	DATE APPROVED

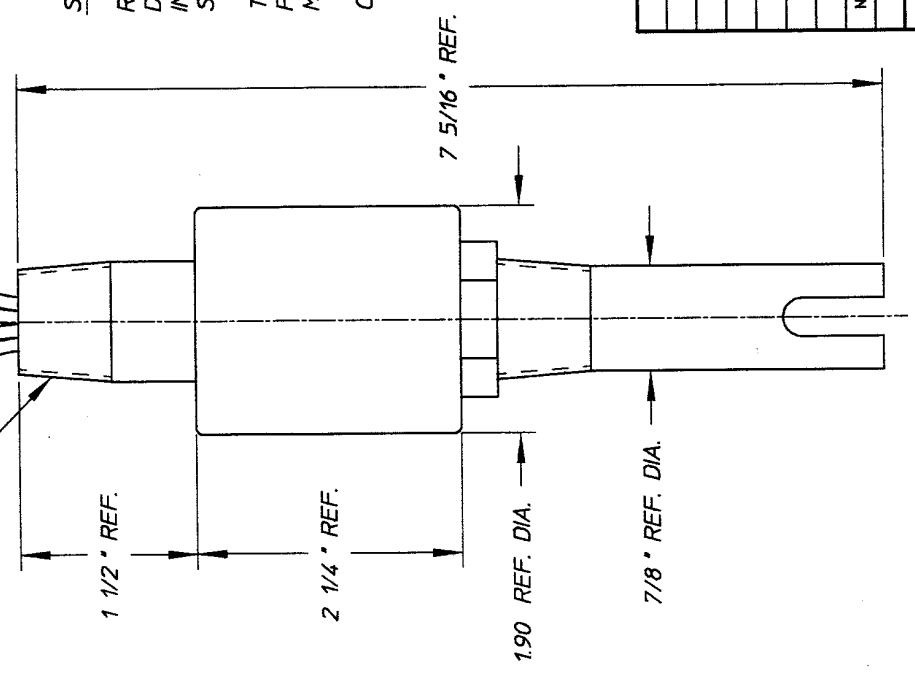


ORDERING INFORMATION:

ULS-11- X - X - X - X - XX

SPECIFICATIONS:

REPEATABILITY: 2mm OR BETER
 DELAY: 0.5 SECONDS
 INPUT POWER: 115V / 230V AC 50/60HZ
 SENSOR WITH ENCLOSURE: 316SS STANDARD
 CONSULT FACTORY FOR OTHER MATERIALS
 TEMPERATURE: -20° F TO +160° F
 PRESSURE: UP TO 1000 PSIG
 MOUNTING: 3/4" NPT
 CONSULT FACTORY FOR OTHER SIZES
 CABLE LENGTH: 12"
 CONSULT FACTORY FOR OTHER LENGTHS

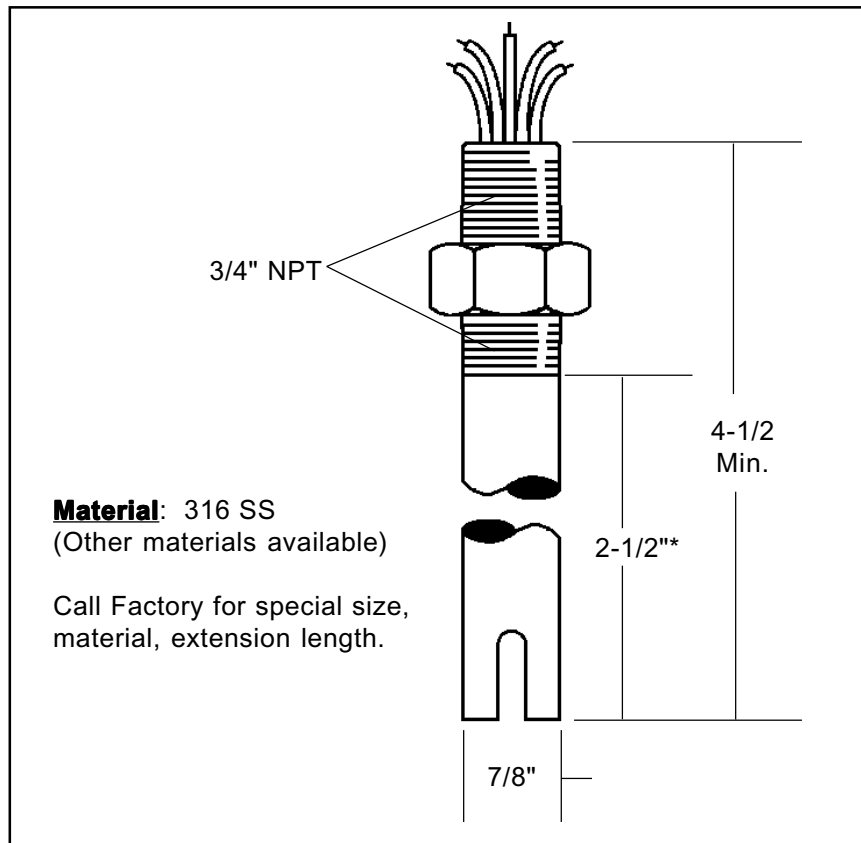


NOTE:
 FOR ORDERING INFO. NOTE SEE SK-3802.

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES. TOLERANCES EXCEPT AS NOTED: DECIMAL .XX ± .010, .XXX ± .005 FRACTIONAL 1/16 ± .005 MACHINE FILLETS AND BREAK MACHINED EDGES .005-.015		CONTRACT NO.	
DMN. CSS	DATE 6/8/95	TITLE ULTRASONIC LEVEL SWITCH ULS-11/20	IMO Industries Inc. Gems Sensors Division Plainville, CT 06062-1198
TRKD. JE	DATE 6/8/95	SIZE CODE IDENT NO. DWG. NO. B 04034 163214	REV.
APPR. CZ	DATE 6/8/95	SCALE 1:1	SHEET 1 OF 1
ACT. WT.	CALC. WT.	C.C. 21251	REV.
NEXT ASSY. USED ON	FINISH	CUSTOMER	REV.
APPLICATION	DRAWING LEVEL	CUSTOMER	REV.

Specifications and Dimensions

Repeatability	2 mm or better
Delay (On)	0.5 seconds
Input Power	9 VDC to 42 VDC (optional A.C.power available)
Leakage Current	Less than 50 mA
Output	One Amp, Relay output (dry contact, N.O. or N.C.)
Protection	Transient, Reverse Polarity
Sensor	316 SS standard. Consult Factory for other materials
Temperature	-20°F to +160°F
Pressure	Up to 1000 psig
Mounting	3/4" NPT STD. (For special mounting, consult Factory.)
Cable Length	12 Inches (For longer lengths, consult Factory.)
Power Consumption @ 24 VDC	35 mA, Max. (On) 17 mA, Max. (Off)



Maintenance

Electronics are constructed with solid-state components and epoxy-potted. Periodically, check and clean the sensor when used with liquids which cause a coating build-up on the sensor. No other maintenance is required.

Cleaning

If the pipe or vessel to which the unit is mounted is to be steam-cleaned or cleaned with abrasive detergents, remove the entire unit before cleaning by:

- (1) Disconnecting the power at source;
- (2) Opening the housing cover;
- (3) Removing power and control wiring cables;
- (4) Unthreading the sensor.

To reinstall, follow installation procedures.

System Malfunction

Should the system malfunction, notify the Factory immediately.

Warranty

All components of GEMS systems are warranted to be free from defects in material and workmanship for a period of one year from the date of shipment to the original purchaser. This warranty applies to general purchaser and to components installed, serviced and operated according to GEMS' instruction manual.

GEMS will repair or replace, at its option, FOB at its plant or any other location designated, any part which proves to be defective in manufacture or workmanship.

All claims must be made within the Warranty period. No claims outside of the Warranty period will be honored.

Warranties are not applied to any components which have been damaged by improper installation, use exposure to unusual atmospheric conditions or components which have been misused, abused, damaged by neglect or accident. This warranty shall not apply to any components which have been altered or repaired without the prior written consent of GEMS.

GEMS assumes no responsibility or liability for any labor or material or back charges, without written authorization. Any products returned must be with prior written authorization.

THE FOREGOING IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTIES OF MERCHANTABILITY AND/OR FOR FITNESS FOR PARTICULAR PURPOSE AND GEMS ASSUMES NO OTHER LIABILITIES EXPRESS OR IMPLIED. GEMS SHALL NOT BE LIABLE FOR NORMAL WEAR AND TEAR, NOR FOR DIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES. IN NO EVENT SHALL GEMS LIABILITY EXCEED THE PRICE OF ITS PRODUCT AT THE TIME OF PURCHASE.



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