



Approval # 20020004  
(Replaces 990053-u)

Environmental & Regulatory Services Division  
Bureau of Petroleum Products and Tanks  
201 West Washington Avenue  
P.O. Box 7837  
Madison, WI 53707-7837

## Wisconsin COMM 10 Material Approval

Equipment: Auto/Stik II, and Auto/Stik Junior Continuous Automatic Tank Gauging Systems, LS-Series Liquid Sensors & Electronic Line Leak Detection

Manufacturer: EBW, Inc.  
2814 McCracken Avenue  
Muskegon, MI 49441

Expiration of Approval: December 31, 2004

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### SCOPE OF EVALUATION

The 960 Series Auto/Stik II, and 970 Series Auto/Stik Junior Automatic Tank Gauging (ATG) Systems manufactured by EBW, Inc., were evaluated as a means of monthly monitoring in accordance with **s. Comm 10.61 (4)**, and as a means of tank tightness testing in accordance with **s. Comm 10.61 (3)** of the Wisconsin Flammable and Combustible Liquids Code. The 960 Series Auto/Stik II, and 970 Series Auto/Stik Junior were also evaluated as a means of continuous statistical leak detection for underground tanks in accordance with **s. Comm 10.61 (4)**. The LS-3A, LS-7A, and LS-30A non-discriminating liquid sensors and LS-5A, and LS-35A discriminating liquid sensors were evaluated as a means of interstitial monitoring in accordance with **s. Comm 10.61 (7)**. The LS-10A, LS-15A, and LS-20A discriminating liquid sensors were evaluated as a means of groundwater monitoring in accordance with **s. Comm 10.61 (6)**.

This evaluation summary is condensed to provide the specific installation, application and operation parameters necessary to maintain the subject systems in compliance with the Wisconsin Administrative Code – Comm 10.

## **DESCRIPTION AND USE**

### **Auto/Stik II and Auto/Stik Junior**

The Auto/Stik models consist of a console and keypad that can accommodate various types of probes and sensors. The standard ATG probe (960/961 series) is a magnetostrictive probe that senses the liquid level. Each probe has temperature sensors that are used to correct the level for temperature effects. A water sensor is used to detect water ingress.

*Note: EBW 970 and 973 probes are for inventory measurements only, and cannot be used for leak detection purposes.*

The Auto/Stik models may be used on tanks that contain gasoline, diesel, aviation fuel, #4 fuel oil, waste oil and some solvents.

### **Auto/Stik II and Auto/Stik Junior w/CSLD**

When used for continuous statistical leak detection (monthly monitoring), the system determines when the tank is stable enough to begin data collection. At the beginning of each month, the Auto/Stik activates its “quiet time” search. This is performed for 24 days in six, four day long periods. The software will look for the quiet times to calculate leak rates during the four-day periods. At the end of each four-day period a leak rate is calculated on the data collected. If it passes the 0.2 gph test, the test is ended for the month. If the leak rate does not pass, or if the data was insufficient for performing the calculation, the next four-day test period begins. Testing will continue for up to six tests per month, and on the 25<sup>th</sup> day of the month a report is generated showing the final results. If the tank failed the 0.20 gph test for the month, or if the data was insufficient for performing the calculation, the operator must before the end of the month manually run a four-hour static test.

*Note: For all models, monthly and annual testing can only be performed on one tank at a time. If several tanks are manifolded together, a isolation valve has to be installed so as to separate the tanks individually. The Auto/Stik II and Auto/Stik Jr. ATG's have the capability to automatically isolate the tanks when interfaced electronically with the solenoid valves.*

### **Electronic Pressurized Line Leak Detector**

The EBW Electronic Pressurized Line Leak Detector is designed to monitor 1 to 8 pressurized lines utilizing the Auto/Stik II 960 console with software version of 37 or higher. One pressure transducer, LS-300A, is required for each line. The transducers can be installed at either end of the pressurized line. The system is compatible with a variety of submersible pumps, and can monitor steel, fiberglass or flexible piping. It is compatible with gasoline, diesel, aviation fuel, #4 fuel oil, waste oil and some solvents.

The system works by monitoring system static pressure (must be  $\geq 22.5$  psi prior to test start or test will not be performed); and pressure decay rate immediately following pump operational off-

on-off cycle. Pressure decay is measured from pump operating pressure down to a fixed pressure that is dependant on type of test- hourly, monthly, or annual.

Hourly tests are conducted automatically every 45 minutes by monitoring the rate of pressure decay from the pump operating pressure down to 7.5 psi. After the initial test, a new test is performed every 5 minutes (at 50, 55 minutes and so on) until 3 consecutive pass or fails are achieved. If the system test fails, the pump is shut-off by the system, an audible alarm sounds, alarm light flashes, and a report is printed. If the system passes the leak test, testing is repeated again in 45 minutes.

Monthly monitoring will be conducted automatically after the pump has been turned off for 3 hours by monitoring the rate of pressure decay from pump operating pressure down to 15 psi. If test passes the first time, testing is completed. If a fail occurs, the pump is activated again and the line is repressurized (5 minute interval). After 3 consecutive fails, an alarm light flashes and a report is printed indicating that a 0.20 gph leak has been detected. The system will continue to conduct tests until a test is passed. Upon completion of a single successful test, a report will be printed indicating that a monthly test has been completed.

Annual tightness testing will be conducted automatically after the pump has been turned off for 6 hours by monitoring the rate of pressure decay from the pump operating pressure down to 20 psi. If test passes the first time, testing is completed. If a fail occurs, the pump is activated again and the line is repressurized (5 minute interval). After 3 consecutive fails, an alarm light flashes and a report is printed indicating that a 0.20 gph leak has been detected. The system will continue to conduct tests until a test is passed. Upon completion of a single successful test, a report will be printed indicating that a monthly test has been completed.

### Liquid Sensors

The Auto/Stik Liquid Sensors are designed to detect fluids in the interstitial space of double-wall tanks or piping and in sumps or ground water monitoring wells.

The LS-3A, LS-7A, and LS-30A non-discriminating liquid sensors consist of a float switch that responds to a change in the level of any liquid. The LS-5A, LS-10A, LS-15A, LS-20A and LS-35A discriminating liquid sensors use a float switch to respond to all liquid level changes and have a selectively-permeable polymer strip that responds only to hydrocarbons. The Auto/Stik console creates an audible and visual alarm and a printout identifying when a specific sensor has been activated.

## **TESTS AND RESULTS**

### Auto/Stik II and Auto/Stik Junior

Testing of all Auto/Stik models for monthly monitoring and tank tightness testing was conducted in accordance with the EPA Automatic Tank Gauging Systems protocol. When using leak declaration thresholds of 0.05 gph and 0.10 gph, the probabilities of detection of a leak of 0.10 and 0.20 gph, respectively, were certified to within the 95-5 ranges required by the EPA protocols.

Testing of the Auto/Stik II and Auto/Stik Junior for continuous statistical leak detection was conducted in accordance with a modified version of the EPA Automatic Tank Gauging Systems

protocol. When using a leak declaration threshold of 0.07 gph, the probabilities of detection and false alarm were certified to within the 95-5 ranges required by the EPA protocols.

#### Electronic Pressurized Line Leak Detector

Testing of the EBW Electronic Pressurized Line Leak Detector for hourly, monthly, and annual pipeline tightness testing was conducted in accordance with either the EPA Pressurized Pipeline Leak Detection Systems protocol (rigid piping) or a modified version of same protocol adapted for flexible piping. When using leak declaration thresholds of 1.5 gph, 0.10 gph, and 0.05 gph, the probabilities of detection for a leak of 3.0, 0.20 and 0.10 gph, respectively, were certified to within the 95-5 ranges required by the EPA protocols.

#### Liquid Sensors

Testing of the liquid sensors was conducted in accordance with a modified version of the EPA Standard "Liquid-Phase Product Detectors" protocol.

**MONITORING SYSTEM OUTPUT**

Detailed here are examples of the typical Alarm Report, Tank Leak Report, Tank Auto Leak Report, and Line Leak Test Report.

<p><b>ALARM REPORT:</b> Automatically prints after every alarm condition programmed &lt; ON &gt; is true.</p> <p>----- ALARM REPORT -----</p> <p>WED MAY 22,96 4:58:36 PM</p> <p>STATION NAME:</p> <p>TANK 1 PRODUCT: PREM UNLEAD</p> <p>HI WATER ALARM: WED MAY 22,96 5:34.51 PM</p> <p>LOW ALARM: WED MAY 22,96 5:34.51 PM</p> <p>HIGH ALARM: WED MAY 22,96 5:34.51 PM</p> <p>-----</p> <p>TANK 2 PRODUCT: LEAD FREE</p> <p>NO PREVIOUS TANK ALARMS</p> <p>-----</p> <p>CONTACT 3: MON MAY 20,96 4:45:25 PM</p> <p>-----</p>	<p><b>LEAK REPORT:</b> Automatically prints after every leak test, manual or automatic.</p> <p>----- AUTO LEAK TEST -----</p> <p>WED MAY 22,96 5:47:21 PM</p> <p>STATION NAME: GENES SERVICE SHERMAN MUSKEGON MI</p> <p>TANK 1 PRODUCT: DIESEL</p> <p>LEAK RATE: 0.009 gal/hr PASS 0.2 GPH TEST</p> <p>PERCENT OF TANK TESTED: 41.1 % START: SUN MAY 19,96 12:00:02 AM BEG FUEL LEVEL: 51.5870 in BEG WATER LEVEL: 0.0357 in 850.905 gal, 53.04 °F 850.917 gal, 53.02 °F 850.928 gal, 53.00 °F 850.936 gal, 52.98 °F END: SUN MAY 19,96 4:09:01 AM END FUEL LEVEL: 51.5870 in END WATER LEVEL: 0.0352 in</p> <p>-----</p>
<p><b>Tank Alarm Report Example:</b> Last alarm report for all active tanks.</p>	<p><b>Tank Leak Report Example:</b> Last leak report for all active tanks.</p>

**AUTOLEAK REPORT: Automatically prints  
on day 25 when AutoLeak Mode is  
turned < ON >.  
AVAILABLE IN 24 HOUR  
AUTOLEAK SOFTWARE ONLY**

----- **AUTOLEAK REPORT** -----

**THU JAN 25,96 9:46:28 AM**

**STATION NAME:**

**EBW TEST SITE  
2814 McCracken Ave.  
(800) 475-5151  
MUSKEGON, MI 49441**

**TANK 1 PRODUCT: NO LEAD**

**LEAK RATE: -0.09 gal/hr  
PASS 0.2 GPH TEST**

**LEAK TEST START:**

**MON JAN 01,96 12:00:00 AM**

**TEST 1: ??? gal/hr  
TEST 2: 0.09 gal/hr  
TEST 3: ??? gal/hr  
TEST 4: ??? gal/hr  
TEST 5: ??? gal/hr  
TEST 6: ??? gal/hr**

**LEAK TEST END:**

**SAT JAN 13,96 12:00:00 AM**  
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**Auto Leak Report Example:** Current status  
of 24-hour leak detection (CSLD) for all active  
tanks.

-----LINE LEAK REPORT-----	-----LINE LEAK REPORT-----
MON JAN 13, 97 4:01:33 PM	MON DEC 02, 96 12:00:37 AM
<b>STATION NAME:</b> EBW TEST SITE 2814 McCracken Avenue Muskegon, Michigan 49441	<b>STATION NAME:</b> EBW TEST SITE 2814 McCracken Avenue Muskegon, Michigan 49441
GASOLINE	GASOLINE
<b>CURRENT STATUS: NO ERRORS</b>	<b>CURRENT STATUS: DID NOT HOLD PSI</b> MON JAN 06, 98 1:28:32 AM
0.2 GPH MONTHLY PASS: YES	0.2 GPH MONTHLY PASS: NO
0.2 GPH TEST HISTORY:	0.2 GPH TEST HISTORY:
JAN: PASS	JAN: FAIL
DEC: FAIL	DEC: PASS
NOV: PASS	NOV: FAIL
OCT: PASS	OCT: PASS
SEP: PASS	SEP: FAIL
AUG: FAIL	AUG: PASS
<b>LAST 0.2 GPH TEST: PASS</b> TUE FEB 11, 97 1:30:04 AM	<b>LAST 0.2 GPH TEST</b> ??? ??? 00:00 00:00:00 AM
<b>LAST 0.1 GPH TEST: PASS</b> TUE FEB 11, 97 4:45:12 AM	<b>LAST 0.1 GPH TEST</b> ??? ??? 00:00 00:00:00 AM
<b>Definitions:</b>	
YES = Monthly 0.2 GPH test has completed successfully.	
NO = Monthly 0.2 GPH test has NOT completed successfully.	
PASS = 0.2 and/or 0.1 GPH test has passed.	
FAIL = 0.2 and/or 0.1 GPH test has failed	
' ' = No 0.2 GPH test performed during this test period.	
<b>Line Leak Report Examples: Pass and Fail conditions.</b>	

**LIMITATIONS / CONDITIONS OF APPROVAL**

**General**

- All monitoring equipment shall be installed, calibrated, operated, and maintained in accordance with the manufacturer instructions, and certified every 12 months for operability, proper operating condition, and proper calibration. Records of sampling, testing, or monitoring shall be maintained in accordance with Comm 10.625
- The manufacturer shall submit for a revision to this Wisconsin Material Approval application if any of the functional performance capabilities of this equipment are revised. This would include, but not be limited to changes in software, hardware, or methodology.

**Auto/Stik II and Auto/Stik Jr. ATG's** (static monitoring)

- Critical performance parameters for the Auto/Stik II and Auto/Stik Jr. ATG's with the 960/961 series probes:

Parameter	Value
Maximum Tank Size <sup>1</sup>	<b>Up to 15,000 gallons</b>
Software Version	<b>V30 or V50</b>
Minimum Tank Level	<b>50 %</b>
Waiting time between filling tank and test start	<b>6 hours minimum</b>
Waiting time between dispensing and test start	<b>6 hours minimum</b> (monthly-0.20 gph) <b>2 hours minimum</b> (annual-0.10 gph)
Minimum Test Period <sup>2</sup>	<b>4 hours</b>

1: Monthly and annual testing can only be performed on one tank at a time. If several tanks are manifolded together, a solenoid valve will have to be installed so as to separate the tanks individually. The Auto/Stik II and Auto/Stik Jr. ATG's have the capability to automatically isolate the tanks while testing, when interfaced electronically with the solenoid valves.

2: There must be no dispensing or delivery during testing.

**Auto/Stik II and Auto/Stik Jr. ATG's w/CSLD** (24-hour, 0.2 gph monthly monitoring)

***Note: If the tank fails the 0.20 gph CSLD test for the 25-day period (see description and use), or if the data was insufficient for performing the calculation, the operator must, before the end of the 30th day, manually run the four-hour static test above.***

- Critical performance parameters for the Auto/Stik II and Auto/Stik Jr. ATG's w/CSLD using the 960/961 series probes are (Values are from KWA final report for EBW dated March 12, 1995):

Parameter	Value
Maximum Tank Size <sup>1</sup>	<b>Up to 30,000 gallons</b>
Software Version	<b>V31 or V51</b>
Minimum Tank Level	<b>30%</b>
Maximum Monthly Throughput	<b>150,000 gallons</b>

1: Monthly and annual testing can only be performed on one tank at a time. If several tanks are manifolded together, a solenoid valve will have to be installed so as to separate the tanks individually. The Auto/Stik II and Auto/Stik Jr. ATG's have the capability to automatically isolate the tanks while testing when interfaced electronically with the solenoid valves.



**EBW Electronic Pressurized Line Leak Detector** (Auto/Stik II only)

- The EBW Electronic Pressurized Line Leak Detector is approved for use on pipeline systems for underground storage tank facilities that contain petroleum or other chemical products. It is approved for use on rigid piping and flexible piping.

**Note:** EBW has an OEM agreement with Campo/Miller to interface the LS-300-120 Plus AL transducer with the electronics module in the Auto/Stik II 960 console for manufacture and marketing of the EBW Electronic Pressurized Line Leak Detector system.

- An annual test of the operation of the leak detector shall be conducted in accordance with the manufacturer requirements for testing to the recognized leak thresholds by inducing a physical line leak. The individual performing the test must be qualified by the equipment manufacturer.
- **Mechanical line leak detectors cannot be installed in the same line as the electronic line leak detector.**
- This test can be used if trapped vapor is present in the system. No special test is required to check the pipeline for trapped vapor prior to the pipeline test.
- Critical performance parameters for the **Electronic Pressurized Line Leak Detector** (Auto/Stik II 960 console with LS-300A pressure transducer- software version 32 or higher) Values are from KWA final report for EBW dated May 10, 1997; and KWA addendum to the June 23, 1995 evaluation of the Campo/Miller LS-300-120 Plus AL system dated September 10, 1998.

Parameter	Value
Minimum Flexible Piping Bulk Modulus	<b>4,485 psi</b>
Total maximum allowable volume of product in any <b>flexible</b> test pipeline	<b>39.5 gallons or less</b>
Total maximum allowable volume of product in any <b>rigid</b> test pipeline	<b>163 gallons or less</b>

**Note:** All other critical parameters, such as test line pressure; minimum test times; minimum wait times between product dispensing and start of test are pre-programmed into the software and are not accessible for viewing.

**Liquid Level Sensors**

The Liquid Sensors shall be placed such that a release from any portion of the tank or piping will be detected. All sensors can be used with either the Auto/Stik II or Auto/Stik Jr. console.

<b>Part Number</b>	<b>Description</b>	<b>Application</b>
LS-3A	Liquid Level Sensor	Piping/Dispenser Sump Tank Interstitial
LS-7A	Horizontal Liquid Sensor	Fiberglass Tank Interstitial
LS-30A	Dual Float liquid Sensor	Fiberglass Tank Hydrostatic Reservoir
LS-5A	Discriminating Sump/ Dispenser Pan Sensor	Piping/Dispenser Sump
LS-10A LS-15A LS-20A	Monitoring Well Sensors	7' to 10' monitoring wells 10' to 15' monitoring wells 15' to 20' monitoring wells
LS-35A	Dual Float liquid Sensor w/Hydrocarbon Sensing Strip	Fiberglass Tank Hydrostatic Reservoir

This approval will be valid through December 31, 2004, unless manufacturing modifications are made to the product or a re-examination is deemed necessary by the department. The Wisconsin Material Approval Number must be provided when plans that include this product are submitted for review.

**DISCLAIMER**

The Department is in no way endorsing or advertising this product. This approval addresses only the specified applications for the product and does not waive any code requirement unless specified in this document.

Reviewed by: \_\_\_\_\_

Greg Bareta, P. E.  
Engineering Consultant  
Bureau of Petroleum Products and Tanks

Approved by: \_\_\_\_\_

Date: \_\_\_\_\_

**Liquid Level Sensors**

The Liquid Sensors shall be placed such that a release from any portion of the tank or piping will be detected. All sensors can be used with either the Auto/Stik II or Auto/Stik Jr. console.

<b>Part Number</b>	<b>Description</b>	<b>Application</b>
LS-3A	Liquid Level Sensor	Piping/Dispenser Sump Tank Interstitial
LS-7A	Horizontal Liquid Sensor	Fiberglass Tank Interstitial
LS-30A	Dual Float liquid Sensor	Fiberglass Tank Hydrostatic Reservoir
LS-5A	Discriminating Sump/ Dispenser Pan Sensor	Piping/Dispenser Sump
LS-10A LS-15A LS-20A	Monitoring Well Sensors	7' to 10' monitoring wells 10' to 15' monitoring wells 15' to 20' monitoring wells
LS-35A	Dual Float liquid Sensor w/Hydrocarbon Sensing Strip	Fiberglass Tank Hydrostatic Reservoir

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**DISCLAIMER**

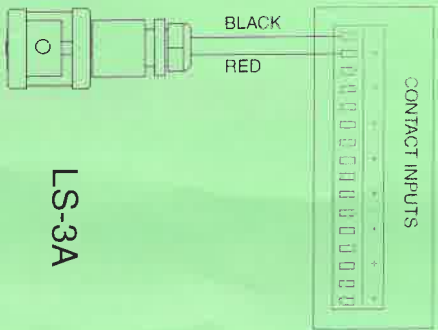
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Greg Bareta, P. E.  
Engineering Consultant  
Bureau of Petroleum Products and Tanks

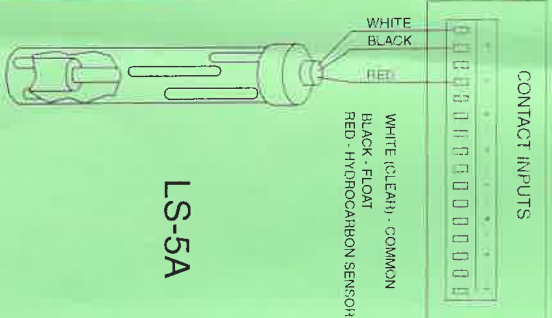
Approved by: \_\_\_\_\_

Date: \_\_\_\_\_



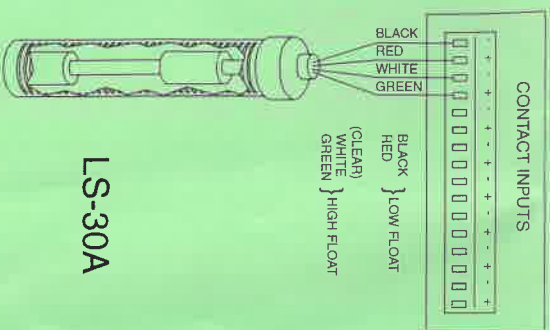
LS-3A

TYPICAL WIRING DIAGRAMS  
INTRINSICALLY SAFE INPUT CONTACTS



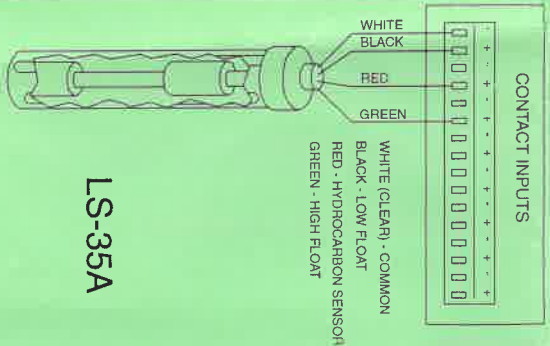
LS-5A

TYPICAL WIRING DIAGRAMS  
INTRINSICALLY SAFE INPUT CONTACTS



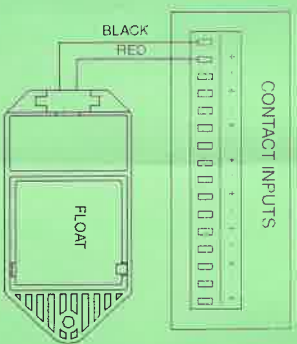
LS-30A

TYPICAL WIRING DIAGRAMS  
INTRINSICALLY SAFE INPUT CONTACTS



LS-35A

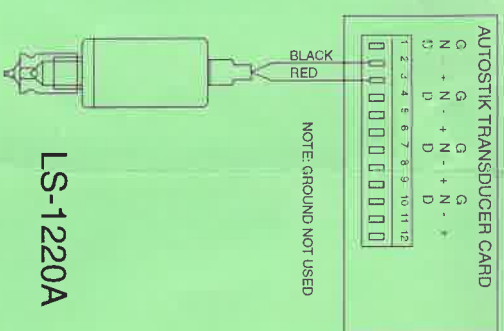
TYPICAL WIRING DIAGRAMS  
INTRINSICALLY SAFE INPUT CONTACTS



LS-7A

- INSTALLATION INSTRUCTIONS
1. INSERT FISH TAPE THROUGH ANNULAR SPACE.
  2. ATTACH PULL-STRING TO LS-7A.
  3. ATTACH FISH TAPE TO PULL-STRING.
  4. PULL LS-7A THROUGH ANNULUS.
  5. MATCH TAG MARK ON SIGNAL CABLE AND PULL STRING.
  6. POSITION THE LS-7A AT THE BOTTOM OF TANK.

TYPICAL WIRING DIAGRAMS  
INTRINSICALLY SAFE INPUT CONTACTS

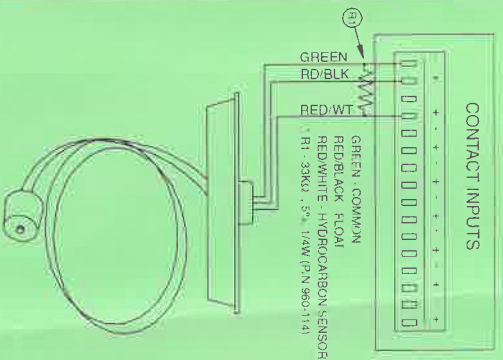


LS-1220A

NOTE:

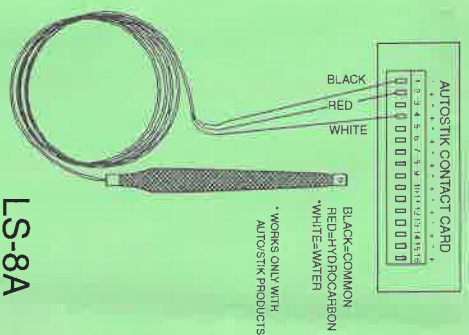
FOUR SENSORS PER  
960-221-01 TRANSDUCER  
MODULE. MAXIMUM 28  
SENSORS WITH 7 MODULES  
PER CONTROLLER.

TYPICAL WIRING DIAGRAMS  
TRANSDUCER INTERFACE MODULE



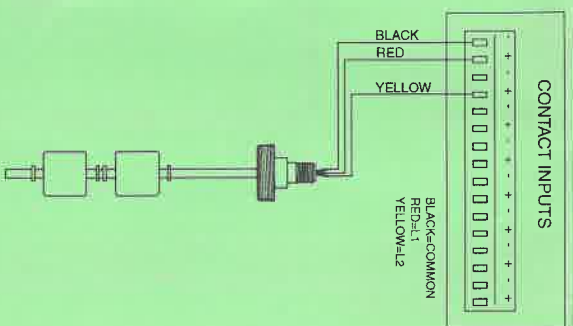
LS-10A, 15A, 20A

\* to be used only with AutoStik products.



LS-8A

- INSTALLATION INSTRUCTIONS
1. INSERT FISH TAPE THROUGH ANNULAR SPACE
  2. ATTACH PULL-STRING TO LS-8A
  3. ATTACH FISH TAPE TO PULL-STRING
  4. PULL LS-8A THROUGH ANNULUS
  5. MATCH TAG MARK ON SIGNAL CABLE AND PULL STRING
  6. POSITION THE LS-8A AT THE BOTTOM OF TANK



LS-800A  
LS-801A