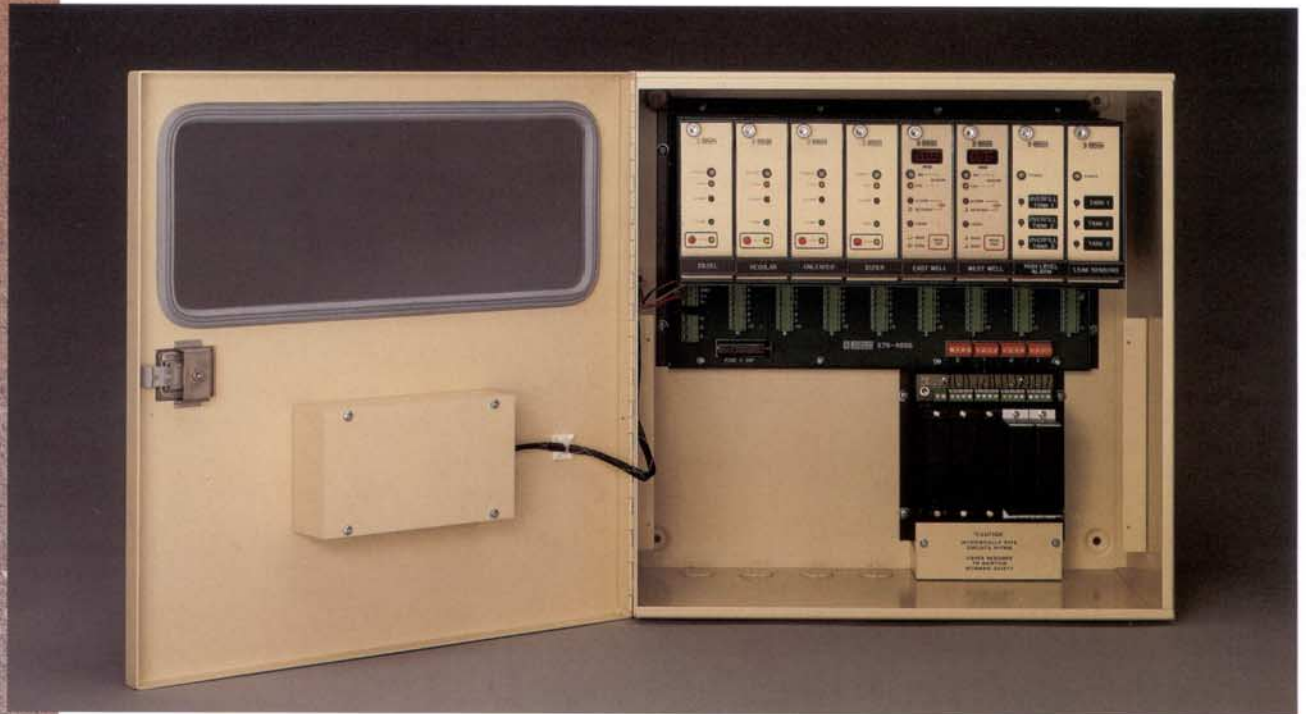


SERIES X76LVC  
LEAK DETECTION SYSTEM



 **RONAN**



## SERIES X76LVC LEAK DETECTION SYSTEM

Federal and State Laws require that all underground hazardous material storage facilities be monitored for leaks to prevent contamination of the soil and seepage into the water table. To comply with these laws different approaches may be taken to assure the detection of these leaks. Ronan's approach monitors the facilities continuously in all critical areas and complies with the EPA recognized methods of external leak detection. The equipment has found an exceptionally high level of acceptance by the cognizant agencies and major oil companies.

The Series X76 Systems have successfully been in operation for many years in gasoline stations, airport fueling facilities, transit systems, military and other government installations, emergency generating facilities for hospitals, high rise buildings, fire pumps, etc. The systems' main application which monitors hydrocarbons, such as gasoline and fuel oil, has been expanded to include chemicals and cleaning fluids.

### System Description

The Series X76LVC is designed to monitor liquid level, vapor density, pressure and hydrostatic pressure. The system generates an alarm and may shut down specific facilities if preset parameters are exceeded. The microprocessor based system provides visual and audible alarms, self-diagnostics and sensor failure indication, fail-safe shutdown and auxiliary switch outputs for communications to a facility's remote displays.

The liquid level sensors will indicate presence of liquids in the annular space of double-wall tanks, secondary containment pipes, manhole or caisson compartments and in-tank high level to prevent overflow.

The vapor density, measured by the product's unique vapor transducer, is indicated on the appropriate plug-in module in parts per million (ppm) by means of a 4½ digit LED display. The display not only indicates the initial background vapor density in a vadose well or the annulus of any secondarily contained vessel, but also monitors an increasing trend of vapor density. The self-contained display also provides the ability to set the alarm and shutdown setpoints without additional calibration equipment.

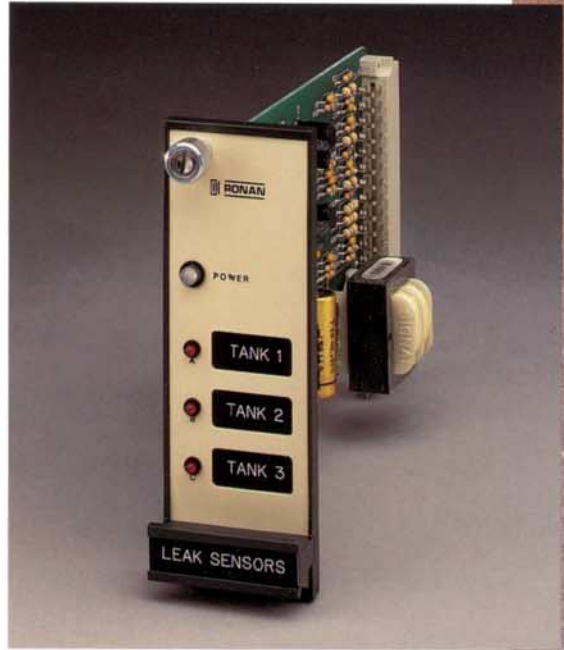
The pressure measurement utilized to monitor pressurized supply piping reads the pressure decay caused by a leak rate greater than 0.1 gph occurring between automatic test cycles.

A hydrostatic measurement is applied to the annulus of a double-wall tank by detecting a loss of pressure in the pressurized cavity or the loss of liquid level in a reservoir or the annulus of the tank.

The X76LVC System, housed in an attractive wall mounted NEMA Type 1 Enclosure, contains the intrinsically safe barrier interface to the transducers, a number of three channel alarm modules, vapor modules, and/or dispenser modules. The front door mounted audible alarm and the flashing alarm lights are acknowledged by the ACK button and functionally tested by means of the TEST push button.

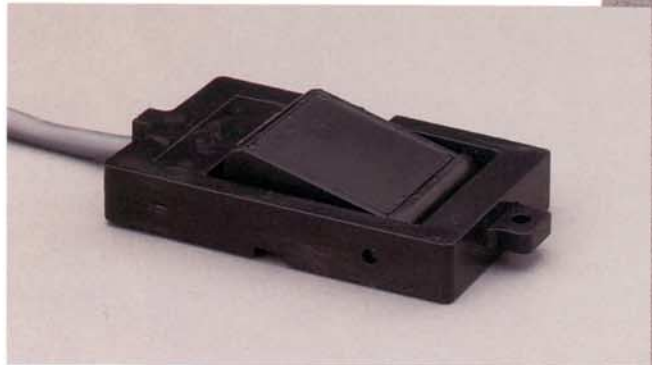
## Alarm Contact Input Module/Model X76AM

The X76AM Alarm Module provides for up to three contact inputs typically from the horizontal liquid level sensor LS-7, the vertical level sensor LS-3, the hydrostatic leak sensor LS-30 and the pressure/vacuum decay sensors JT-2P and JT-2V. The sensor contacts transfer if liquid is present in the annular space of a double-wall tank, secondary containment pipes, manhole or caisson compartments. The alarm module monitors the status of the contacts and, should an abnormal condition occur, the front panel mounted LED's will flash for a visual alarm indication and the audible alarm turns on. The system ACK push button allows the operator to silence the audible alarm and changes the flashing light to steady on. The green LED shows availability of power to the module and the contacts. The module's integral switches allow selection of normally open (sensor contact open with no liquid) or normally closed (sensor contact closed with no liquid) sensor input signals to the alarm module.



## Liquid Level Sensor/Model LS-7

The Model LS-7 Liquid Level Sensor is designed for horizontal orientation applications where access is difficult, such as the bottom of dual-wall fiberglass tanks. The custom engineered unit provides highly reliable point level sensing. The plastic protected Reed switch guarantees long, trouble-free performance and compatibility with all hydrocarbon liquids.

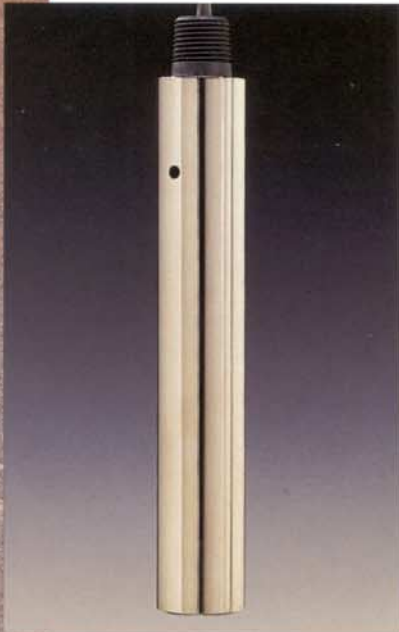


## Liquid Level Sensor/Model LS-3

The Model LS-3 Liquid Level Sensor is most suitable for applications in steel and double-wall tanks. The sensor is positioned vertically, close to the bottom of the tank annulus or at maximum fuel level inside of the tank to prevent overflow. The all polysulfone level switch housed in a stainless steel outer jacket features a totally sealed single pole, single throw contact actuated by a float.



# CONTAINMENT MONITORING



## Hydrostatic Reservoir Sensor Model LS-30

The Model LS-30 Hydrostatic Reservoir Leak Sensor is designed to detect changes in liquid level within reservoirs of hydrostatic monitored double-wall tanks. Constructed of 304 stainless steel, polysulfone, Beryllium Copper and PVC, the LS-30 will provide years of trouble-free service.

The LS-30 can be installed to provide discrete indications of liquid increase or liquid loss, or provide high either/or low liquid indications. A breach of the tanks inner wall will allow reservoir liquid to escape the interstice into the primary tank, and a reservoir level drop will occur. A breach of the outer tank wall will allow reservoir liquid to escape the interstice into the environment, or ground water to enter the interstice, and a reservoir level change will occur. Liquid increase or loss, sufficient to move the sensor's float will transmit a signal to the control panel to initiate control functions or annunciate alarms.



## Pressure/Vacuum Sensor Models JT-2P & JT-2V

The Models JT-2P and JT-2V Loss of Pressure/Vacuum Sensor Assemblies consists of a switch, fill valve and the safety release valve. The units are used to monitor the annulus pressure/vacuum of a double-wall tank. The annulus is initially pressurized or evacuated from an external source and sealed. A leak in the secondary containment will be sensed by the transfer of the switch if the pressure falls below 1.0 psi or 1.0" Hg.

Note: Before applying this type of measure, consult tank manufacturer.



## Intrinsic Safety Barriers

Electrical equipment connected to switches located in a hazardous area, typically existing in gasoline or other hydrocarbon liquid storage facilities, requires the use of an explosion proof switch and sealed conduit installation or intrinsic safety barriers to limit the electrical energy required to sense the status of the switch in the hazardous area. The barriers not only provide a safe installation, but also provide considerable cost savings by allowing the use of buriable type cables and general purpose type sensors. The barriers, located in a separate compartment within the X76LVC system will provide safe interface to any of the level and pressure sensors classified for general purpose area applications.

# VAPOR & LIQUID MONITORING

## Vapor Input Module/Model X76HVD-4

The Model X76HVD-4 Module measures the vapor concentration in vadose wells, groundwater wells or secondary contained vessels. The microprocessor based input module measures the sensor resistance, which is directly proportional to the vapor concentration and displays the linearized values in parts per million (ppm) via the front panel mounted 4½ digit LED display. The X76HVD-4-2.5 Module is calibrated for a range of 0 to 2,500 ppm for products such as waste oil, diesel, JP-5, etc. The X76HVD-4-20 is used over the range of 0 to 20,000 ppm to measure gasoline, methanol, benzene, toluene, etc. Each module features an adjustable setpoint normally set for 25% of the lower explosive level (LEL) of the specific product monitored. The setpoint is adjusted to the desired ppm readout on the LED display by a front panel mounted potentiometer. Should the vapor concentration exceed the setpoint, a red flashing LED provides visual alarm, an audible alarm is actuated and a transistor switch output operates. The system's common acknowledge push button silences the audible alarm. The LED remains flashing until the vapor concentration returns below the setpoint level.

The module features a front panel mounted amber LED indicator for sensor failure and a two-color LED, green for power on, turning red to show faulty wiring, e.g. short, open or incorrect polarity. Optionally, a contact or conductivity type level switch connected to the module provides indication (red LED) that the sensor is submerged.



## Vapor Sensor/Model HV

The HV Vapor Sensor, a solid state diffusion type, works on the absorption-desorption principle. The detection of a specific vapor is based on the absorption on the catalytic surface at a specific temperature. The gas absorption changes the resistance between the two electrodes embedded in the catalytic element. The resistance change is directly proportional to the vapor concentration and provides the input to the module.

The vapor sensor, consisting of the sensing element contained within an anodized aluminum enclosure, is protected by the porous metal-fiber disc which serves as a flame arrestor. The sensor head assembly is UL listed for hazardous locations: Class I, Division 1, Groups B, C and D.

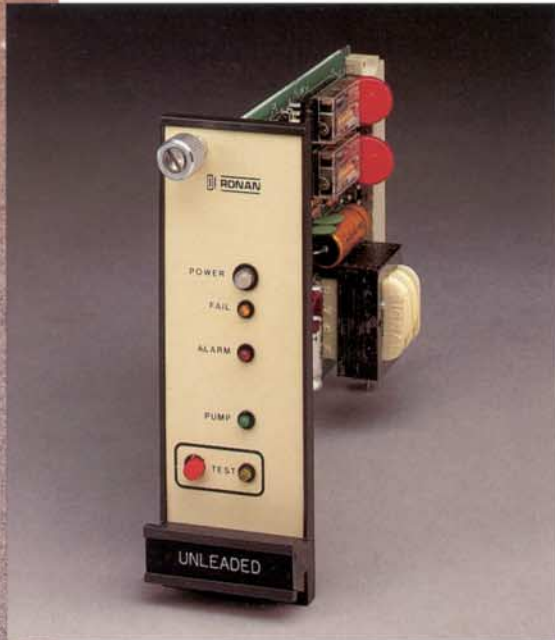


## Aspiration Vapor Sensor/Model HVFS

The Model HVFS Sensor consists of the basic HV sensor housed in a protective plastic enclosure equipped with an air tube connection. This allows aspiration of the sensing element via a vacuum pump with a recommended pumping volume of 1 to 2 SCFH. The aspiration will extend the zone of influence of the sensor for early gas detection in the well and provide considerably faster response time.



# PRODUCT PIPE MONITORING



## Line Leak Monitor/Model X76DM-4B

The Model X76DM-4B Line Leak Monitor is designed to supervise pressurized product supply pipelines typically existing between underground storage tanks and aboveground product dispensers of gasoline, diesel fuel, etc. The microprocessor based module provides timing sequences during which measurement of pressure decay and pressure build-up are taken. LED status indicators, push buttons and remote fault indications relate system performance to the operator.

The Model X76DM-4B utilizes the JT-H2 pipeline pressure transducer assembly and replaces the mechanical leak detector (flow regulator). The Model X76DM-4B executes four basic automatic or manual functions initiated by the TEST push button located on the front panel of the module.

1) At the beginning of each pump activity a test of the supply pipeline is conducted for 4 seconds. If the pipeline does not reach normal operating pressures, the pipeline is shutdown. This test identifies possible catastrophic pipeline failures, pump

malfunctions or low fuel supply conditions.

2) At the end of the activity cycle a test of the supply pipeline is conducted for a selectable time period, typically 20 minutes, to identify a leak of 0.1 gph or greater (defined at 10 psi). This test exceeds the performance required under Federal EPA regulations 40 CFR 280, Subpart D for hourly line leak detection. If a leak is detected, an audible and visual alarm are triggered and the supply pipeline is shutdown, thereby preventing further product loss and contamination to the site.

3) Any time the supply pipeline has been inactive for a period of two hours a test of the supply pipeline is conducted for a selectable time period, typically 20 minutes, to identify a leak of 0.1 gph or greater (defined at 45 psi). This test exceeds the performance required under Federal EPA regulations 40 CFR 280, Subpart D for annual line tightness testing. If a leak is detected, an audible and visual alarm are triggered and the supply pipeline is shutdown, thereby preventing further product loss and contamination to the site.

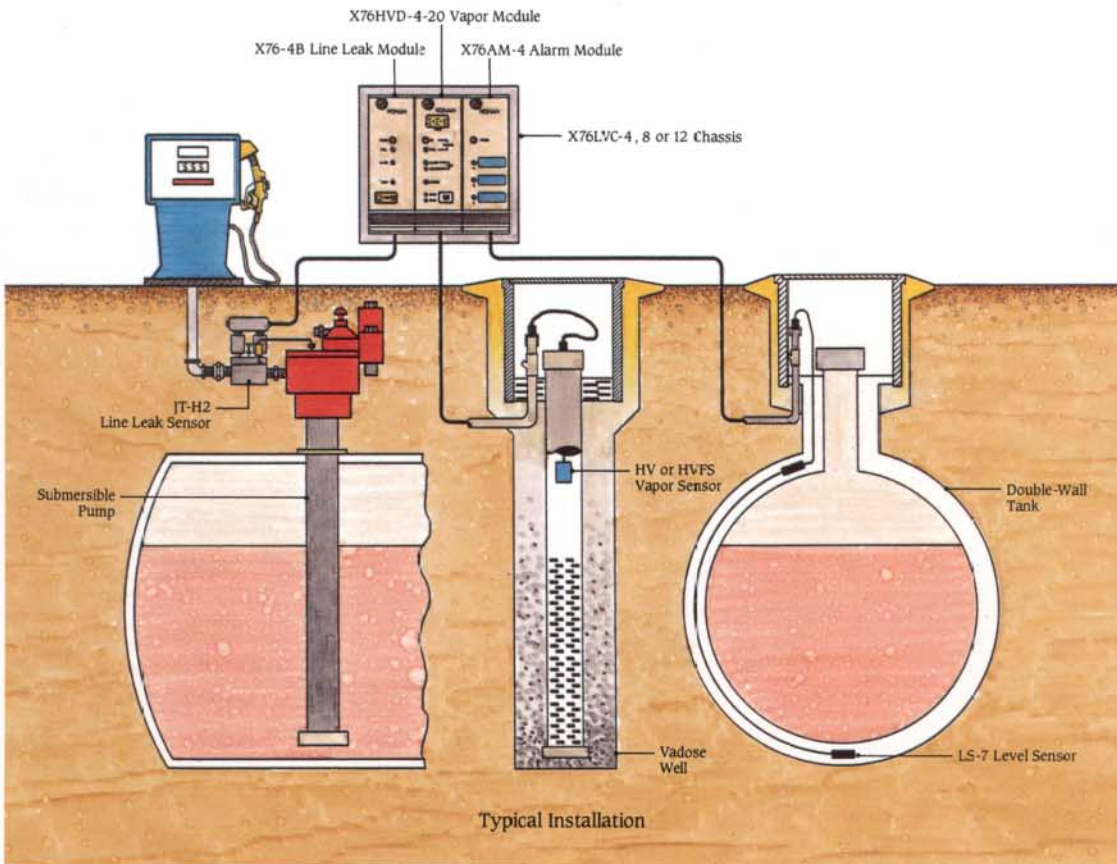
4) If the pipeline pressure should happen to fall below 1 psi between pumping demands, the system will automatically conduct a test of the pipeline to identify leaks exceeding 1.0 gph, defined at 10 psi. If the pipeline is unable to reach normal operating pressure in 4 seconds, an audible and visual alarm are triggered and the supply pipeline is shutdown, thereby preventing further product loss and contamination to the site. This function replaces the mechanical leak detector and identifies supply pipeline pressure losses due to thermal contraction of product, or indicates submersible pump malfunction or low product supplies.

If a leak is detected and an alarm is triggered, the pipeline will be shutdown. The operator may reset the system by manually initiating a reset test by pressing the TEST push button located on the front panel of the module. This Manual Reset initiates a test of the pipeline for 30 seconds to identify leaks exceeding 1.0 gph, defined at 10 psi. When the test is passed the system will automatically reset to an idle condition and the piping system may be returned to service or waiting for the next pump activation.

The five front panel mounted LED indicators provide status as follows: POWER (green) ON indicating power is available, FAIL (amber) ON indicates microprocessor failure, ALARM (red) FLASHING indicates shutdown of the submersible pump and low line pressure, PUMP (small green) ON indicates that the submersible pump is running, TEST (yellow) ON indicates the pipeline is being tested, FLASHING indicates the pipeline is idle.

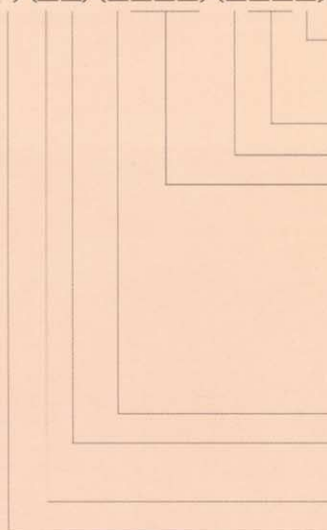
# PRODUCT PIPE MONITORING

The X76DM-4B Line Leak Monitor used in conjunction with the JT-H2 Pipeline Pressure Transducer, does not require the use of a mechanical flow regulator and thereby eliminates the "SLOW FLOW" condition commonly associated with mechanical leak detectors in cold temperatures. As well as preventing additional contamination to the environment by providing positive shutdown of the pipeline when leaks are detected. Typical applications with only a mechanical line leak detector allow continuous pumping in the slow flow mode with leak rates of approximately 3 gph.



## Ordering Information

X76LVC-( )-( )-( )-( )



### Range

- A=0-20,000 ppm plus X76HVD-4-20 Module
- B=0-2,500 ppm plus X76HVD-4-2.5 Module

### Type of Vapor Sensor HV or HVFS

### Quantity of Vapor Sensors

### Probe Type

- LS-3 (\*) Vertical Liquid Level Sensor
- LS-7 Horizontal Liquid Level Sensor
- LS-30 Hydrostatic Reservoir Sensor
- JT-2P Pressure Sensor
- JT-2V Vacuum Sensor

\*NO-Normally Open, NC=Normally Closed

NOTE: 1. All probes use Alarm Module X76AM-4 (3-Alarm/Module)

2. Use additional listings for quantity and type of sensor, e.g. (2LS3)-(1LS10)

### Quantity of Probes

### Type of Leak Sensor and Module

- B=JT-H2 plus X76DM-4B

### Quantity of Line Leak Sensors

### Chassis Size, 4 or 8 Modules

## Options

JT-1-PK	Piping Kit
JT-1-EK	Electrical Kit
JT-H-PK	Piping Kit
JT-H-EK	Electrical Kit

HV	Vapor Sensor (Passive)
HVFS	Vapor Sensor (Aspirating Type)
X76AM-4	Alarm Module (3-Alarm Inputs)
X76DM-4B	Dispenser Module (with JT-H2 Sensor)
X76HVD-4-20	Vapor Module (0-20,000 ppm)
X76HVD-4-2.5	Vapor Module (0-2,5000 ppm)
X57SM-1	Intrinsically Safe Chassis (1 Module/ 3 Contact Inputs per Module)
X57SM-4	Intrinsically Safe Chassis (4 Modules/ 3 Contact Inputs per Module)
X57-376P	Intrinsically Safe Barrier (HVD)
X57-422P	Intrinsically Safe Barrier (3 Inputs)
X76BP-4	Blank Panel

## Spare Parts

LS-3(*)	Vertical Liquid Level Sensor
LS-7	Horizontal Liquid Level Sensor
LS-30	Hydrostatic Reservoir Sensor
JT-1	Line Leak Sensor (High)
JT-1L	Line Leak Sensor (Low)
JT-2P/V	Pressure/Vacuum Sensors
JT-H2	Dual Leak Sensor (Consisting of JT-1 and JT-1L Sensors with EK and PK)

\* NO=Normally Open, NC= Normally Closed.

**Warranty:** Ronan warrants equipment of its own manufacture to be free from defects in material and workmanship under normal conditions of use and service, and will repair or replace any component found to be defective, on its return, transportation charges prepaid, within one year of its original purchase. This warranty carries no liability, either expressed or implied, beyond our obligation to replace the unit which carries the warranty.



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