

LeakFilm Sensor
Film Type Liquid Leak Detection Sensor

1. Safety

Ensure that this Operating Manual is read and understood **BEFORE** installing / operating / maintaining the equipment. Pay particular attention to **Warnings** and **Cautions**. All document Warnings are listed here and repeated where appropriate at the start of the relevant chapter(s) of this Operating Manual. **Cautions** appear in the sections/sub-sections of the document where they apply.

WARNINGS

LeakFilm controllers and sensors are designed for installation and use in ordinary areas only. Do not install the controllers and the sensors in hazardous areas.

Installation must be in accordance with the recognised standards of the appropriate authority in the country concerned.

Access to the terminal block for wiring and switches for configuration of the controller, when carrying out any work, must only be conducted by trained personnel.

Before carrying out any work ensure local regulations and site procedures are followed. Appropriate standards must be followed to maintain the overall certifications.

Never attempt to open a plastic enclosure or connector or replace/refit the wire of the sensor while power is still applied to the controller.

LeakFilm controllers must be earthed/grounded for electrical safety and to limit the effects of radio frequency interference. Earth/ground points are provided "F.G." or "SHIELD" terminal of the controllers.

Ensure that all screens/instrument earth/clean earth wiring is earthed/grounded at a single point (either at the controller or master controller - BUT NOT BOTH) to prevent false readings or alarms that may occur due to potential earth/ground loops.

The plastic enclosure of the controllers is a potential electrostatic charging hazard. Avoid any conditions that could result in the controllers becoming electrostatically charged.

Take care when handling LeakFilm sensors as they may be damaged by sharp tools.

LeakFilm controllers should be handled with care to avoid mechanical shock and impact.

Do not expose to temperatures, humidity and other conditions beyond the storage and operating ranges.

LeakFilm controllers must have a suitably rated fuse.

LeakFilm controllers and sensors should be installed in a location free from dust, direct sunlight, temperature extreme, strong magnetic field and heavy vibration.

2. Information

This manual is for use with LeakFilm Sensors and Controllers range only.

Honeywell Analytics can take no responsibility for installation and/or use of its equipment if not done so in accordance with the appropriate issue and/or amendment of the Technical Manual.

The reader of this Operating Manual should ensure that it is appropriate in all details for the exact equipment to be installed and/or operated. If in doubt, contact Honeywell Analytics for advice.

The following types of notices are used throughout this Operating Manual:

WARNING

Identifies a hazardous or unsafe practice which could result in severe injury or death to personnel.

Caution: *Identifies a hazardous or unsafe practice which could result in minor injury to personnel, or product or property damage.*

Note: Identifies useful/additional information.

Every effort has been made to ensure the accuracy of this document, however, Honeywell Analytics can assume no responsibility for any errors or omissions in this document or their consequences.

Honeywell Analytics would greatly appreciate being informed of any errors or omissions that may be found in the content of this document.

For information not covered in this document, or if there is a requirement to send comments/corrections about this document, please contact Honeywell Analytics using the contact details given on the back page.

Honeywell Analytics reserve the right to change or revise the information supplied in this document without notice and without obligation to notify any person or organisation of such revision or change. If information is required that does not appear in this document, contact the local distributor/agent or Honeywell Analytics.

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4. Introduction

The LeakFilm sensor is a film type sensor that detects liquid leaks. LeakFilm sensors can be installed with various kinds of LeakFilm controllers, so that the leak signal detected by the sensor can be transmitted to the controller immediately to alert users. Depending on the controller type, it is possible to measure the distance between the leak point and the controller.

Advanced Technology

LeakFilm sensor has advanced and unique film type sensing technology based on conductive polymer and PET, which can provide versatile benefits to customers as listed below:

Fast response time

The LeakFilm sensor provides a faster response time than cable type sensors.

Easy to maintain

The LeakFilm sensor can be reused again immediately after removing the leakage. Drying time is much shorter than a cable type sensor.

Easy to install

The LeakFilm sensor itself is <400µm thick, and the overall thickness including the adhesive tape is much thinner than a cable type sensor. LeakFilm sensor's design and technology allows customers to have flexible installation options for pipes, pipe junctions, building basements, inside equipment, facilities, server rooms, etc.

Free to adjust the length of LeakFilm

The LeakFilm sensor can be cut anywhere along the film strip and re-connected again.

Sensitivity

The LeakFilm sensor responds to a small amount of liquid while a cable type sensor requires a larger amount of liquid. The sensor can respond to only 0.8mm height of liquid.

Resistance to False Alarm

The LeakFilm sensor can withstand accidental compression (being stepped on or having objects placed on top of the film) without triggering costly false alarms that suspend production and divert resources.

4. Introduction

4.1 Sensor Types

There are 4 kinds of sensor types in the LeakFilm sensor range, as shown in the below table. Each sensor can be classified by target liquid and whether it is capable of distance detection.

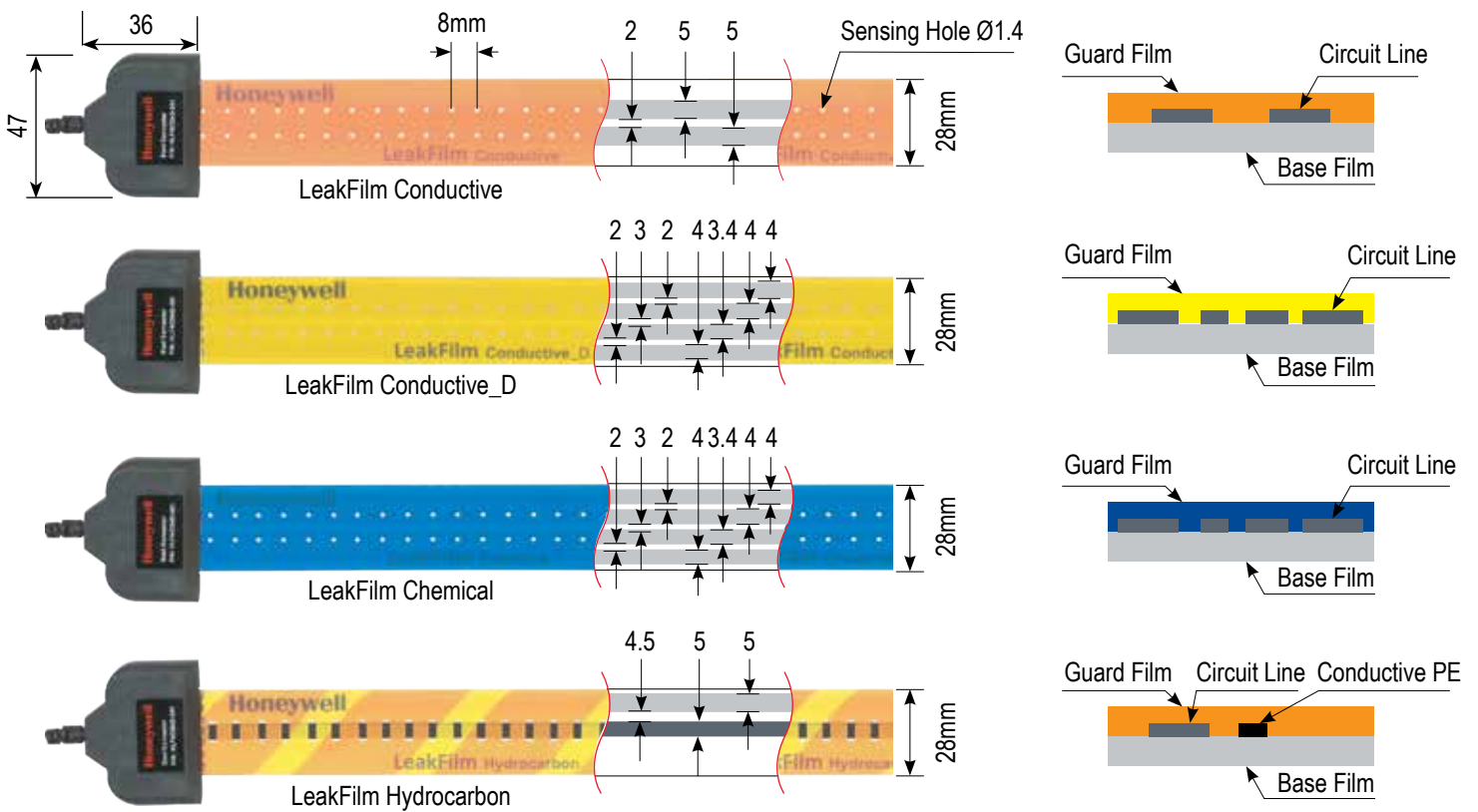
Product name	Target Liquid	Features	Controller
LeakFilm Conductive	Water and Conductive Liquid	Orange Indoor only Reusable	LeakFilm Mini LeakFilm 5
LeakFilm Conductive_D	Water and Conductive Liquid	Yellow Distance detection Indoor only Reusable	LeakFilm Pro
LeakFilm Chemical	Chemical	Blue Distance detection Indoor only Irreversible	LeakFilm Pro
LeakFilm Hydrocarbon	Hydrocarbon	Orange & Yellow Oil detection Indoor only Irreversible	LeakFilm HC

Table 1: Sensor types

4. Introduction

4.2 Sensor Dimension

All 4 types of sensor have the same external dimensions as shown in the below picture.



5. Application

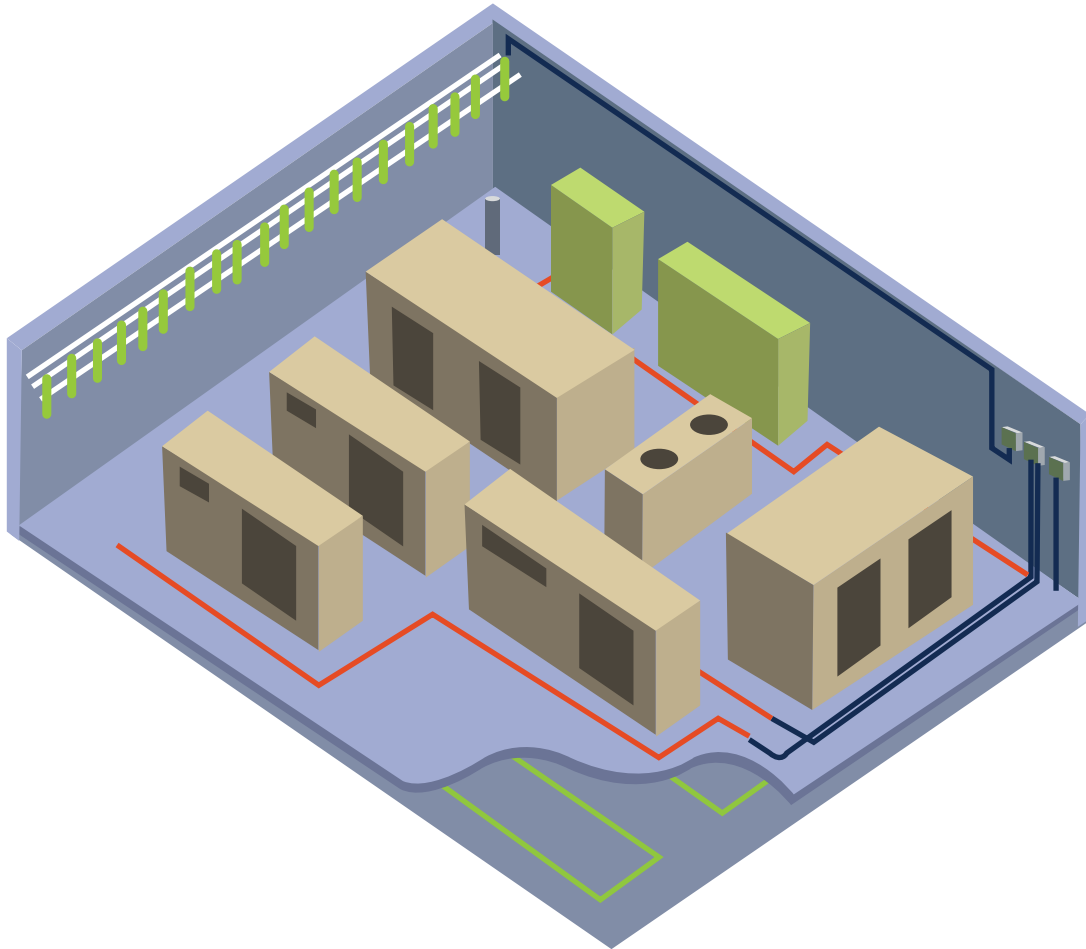


Diagram 2: Typical example of LeakFilm installation

LeakFilm is suitable for below applications;

- Data center and server room
- Communication facilities and network room
- Library
- Museum and heritage site
- Archive storage
- Aquarium
- Control room
- Utility room
- Semiconductor Fab / LED Fab
- Chemical process
- Tanks
- Pipe Lines and Pipe Junctions
- Refineries
- The areas where potential liquid leak is most likely to be present

6. Installation

WARNINGS

LeakFilm controllers and sensors are designed for installation and use in ordinary areas only. Do not install the controllers and the sensors in hazardous areas.

Installation must be in accordance with the recognised standards of the appropriate authority in the country concerned.

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The plastic enclosure of the controllers is a potential electrostatic charging hazard. Avoid any conditions that could result in the controllers becoming electrostatically charged.

Take care when handling LeakFilm sensors as they may be damaged by sharp tools.

LeakFilm controllers should be handled with care to avoid mechanical shock and impact.

Do not expose to temperatures, humidity and other conditions beyond the storage and operating ranges.

LeakFilm controllers must have a suitably rated fuse.

LeakFilm controllers and sensors should be installed in a location free from dust, direct sunlight, temperature extreme, strong magnetic field and heavy vibration.

6. Installation

6.1 Location

The LeakFilm sensor should be installed where a potential liquid leak is most likely to be present. The following points should be noted when locating the sensors.

- When locating the sensors consider the possible damage caused by natural events e.g. rain or flooding.
- Consider ease of access to the sensor for repair and maintenance.
- The sensor and lead cable should not run across any passageways, to avoid abrasion and damage.

6.2 Sensor installation

LeakFilm sensor has double sided tape to adhere to the floor or a flat surface. The following points should be noted when installing the sensors.

- The surface should be clean for better adherence to the sensor.
- Glue or adhesive can be used in addition to standard double sided tape if the surface is not flat or not suitable for double sided tape.

6.3 Connector assembly

LeakFilm provides 4 different types of connectors which are suitable for various installation environments. LeakFilm connectors were designed to be assembled by snapping, so that only a screw driver is required for assembly.

6.4 Maintenance

LeakFilm Conductive and Conductive_D are reusable. Once you wipe out the water from the sensor, it returns to normal immediately. However LeakFilm Chemical and Hydrocarbon are irreversible. Once the liquid has been in contact with the sensor, the part of the sensor wet by the liquid must be replaced or cut. There are 3 options to repair the sensor.

- Replace the wet section with new sensor by using jump connectors. This option works well if the wet point is towards the middle of the sensor.
- Remove or cut the wet section and reassemble the start connector or end connector. This option works well if the wet point is towards the start or end point of the sensor.
- Replace a whole section (connector to connector) of the sensor. This option works well if the above two cases are not applicable.

6. Installation

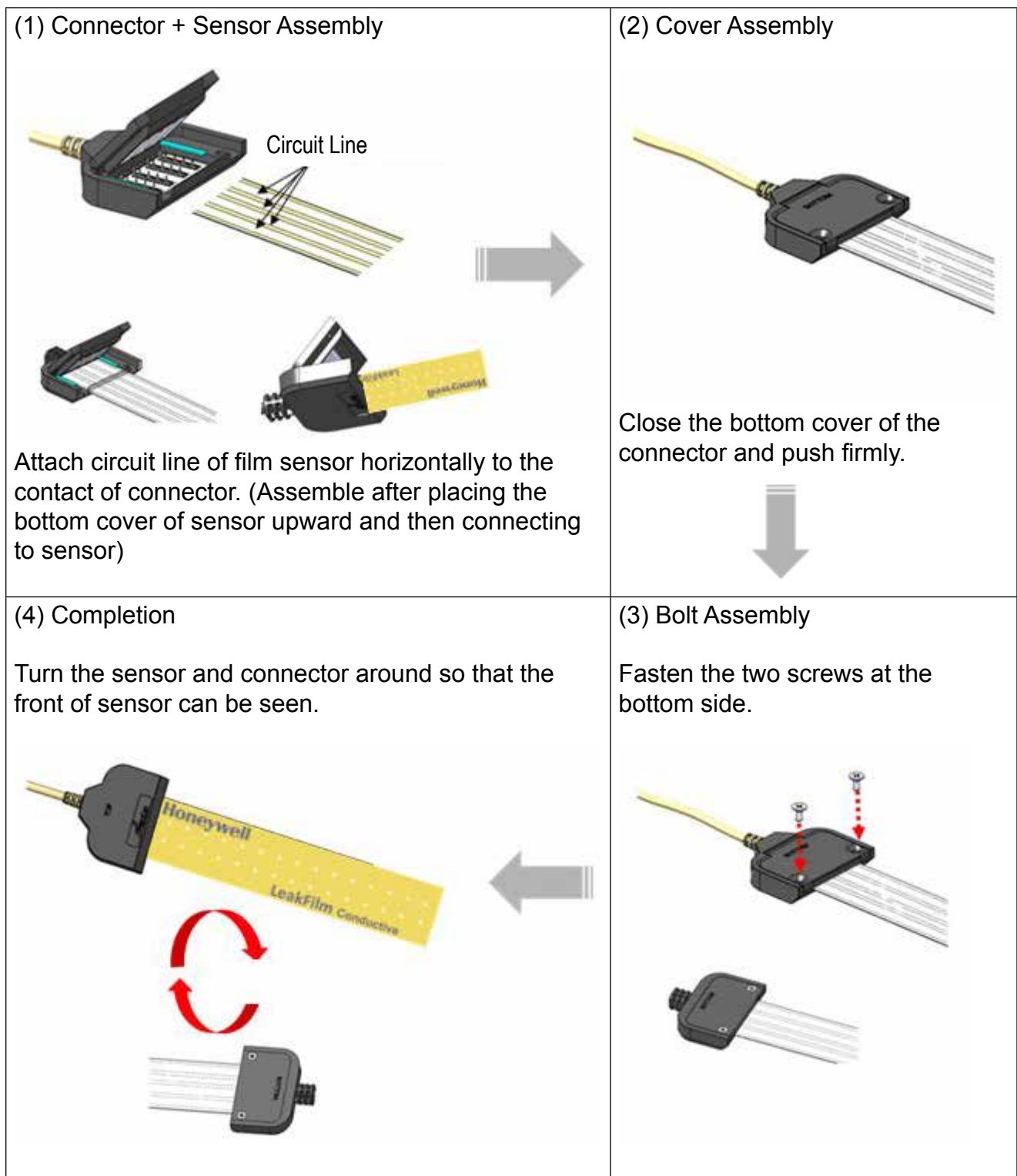


Diagram 3: Connector assembly procedure

6. Installation

6.5 Contact plane of LeakFilm Hydrocarbon

When assembling the connectors with the LeakFilm Hydrocarbon sensor, special care should be taken because the connector pins may be not well aligned with the electrode (Conductive PE in Diagram 1) of the sensor from time to time. In order to prevent the misalignment, LeakFilm Hydrocarbon provides a contact plane at the back side of the sensor every 0.5m as shown in the picture. It is strongly recommended that the connectors assembled with LeakFilm Hydrocarbon should use this plane.

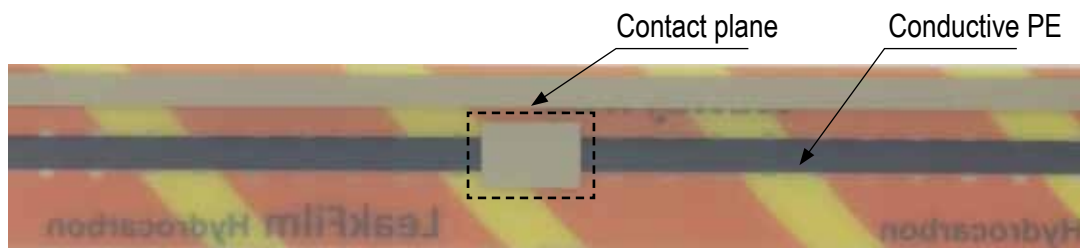


Diagram 4: Contact plane of LeakFilm Hydrocarbon

7. Characteristics and specifications

LeakFilm Conductive

Item	Specification
Target Liquid	Water and Conductive Liquid
Material	PET
Circuit Thickness	5 to 10 μm
Film Thickness	Base Film-120 to 200 μm /Cover Film-100 to 200 μm
Connector Material	PBT
Storage Temperature	-10 to 80 $^{\circ}\text{C}$
Operating Temperature	-10 to 55 $^{\circ}\text{C}$
Operating Humidity	5 to 85 %RH
Weight	Under 20 g/m
Operating voltage	5 VDC
Response time for leakage*	Under 4 sec
Response time for sensor break	Under 4 sec
Length	0.5m to 50m

* Typical response time at 20 $^{\circ}\text{C}$

LeakFilm Conductive_D

Item	Specification
Target Liquid	Water and Conductive Liquid
Material	PET
Circuit Thickness	5 to 10 μm
Film Thickness	Base Film-120 to 200 μm /Cover Film-100 to 200 μm
Connector Material	PBT
Storage Temperature	-10 to 80 $^{\circ}\text{C}$
Operating Temperature	-10 to 55 $^{\circ}\text{C}$
Operating Humidity	5 to 85 %RH
Weight	Under 20 g/m
Operating voltage	5 VDC
Response time for leakage*	Under 4 sec
Response time for sensor break	Under 10 sec
Accuracy	± 1 m (above 10meter)
Length	3 m to 200 m

* Typical response time at 20 $^{\circ}\text{C}$

7. Characteristics and specifications

LeakFilm Chemical

Item	Specification
Target Liquid	Sulfuric acid 88% Hydrofluoric acid 40% Nitric acid 60%
Material	PET
Circuit Thickness	5 to 10 μm
Film Thickness	Base Film-120 to 200 μm /Cover Film-100 to 200 μm
Connector Material	PBT
Storage Temperature	-10 to 80 $^{\circ}\text{C}$
Operating Temperature	-10 to 55 $^{\circ}\text{C}$
Operating Humidity	5 to 85 %RH
Weight	Under 20 g/m
Operating voltage	5 VDC
Response time for leakage*	Under 10sec.
Response time for sensor break	Under 10 sec
Leak location accuracy	± 1 m (above 10meter)
Length	3 to 200 m

* Typical response time at 20 $^{\circ}\text{C}$

LeakFilm Hydrocarbon

Item	Specification
Target Liquid	Liquid organic solvent
Material	PET
Circuit Thickness	5 to 10 μm
Film Thickness	Base Film-120 to 200 μm /Cover Film-100 to 200 μm
Connector Material	PBT
Storage Temperature	-10 to 60 $^{\circ}\text{C}$
Operating Temperature	-10 to 55 $^{\circ}\text{C}$
Operating Humidity	5 to 85 %RH
Weight	Under 20 g/m
Operating voltage	5 VDC
Response time for leakage*	Toluene: under 1min Benzene: under 1min Gasoline: under 1min Diesel: under 5min Kerosene: under 5min Chloroform: under 1min
Response time for sensor break	Under 17sec.
Length	0.5 m to 50 m

* Typical response time at 20 $^{\circ}\text{C}$

8. Ordering Information

Part number	Product Name	Description
LeakFilm Sensor		
HLFSSCNN-100	LeakFilm Conductive	100 meter Conductive Sensor
HLFSSCNN-050		50 meter Conductive Sensor
HLFSSCNN-001		Custom Length Conductive Sensor
HLFSSCND-100	LeakFilm Conductive_D	100 meter Conductive Sensor with Leak Position Detection
HLFSSCND-050		50 meter Conductive Sensor with Leak Position Detection
HLFSSCND-001		Custom Length Conductive Sensor with Leak Position Detection
HLFSSAND-100	LeakFilm Chemical	100 meter Chemical Sensor with Leak Position Detection
HLFSSAND-050		50 meter Chemical Sensor with Leak Position Detection
HLFSSAND-001		Custom Length Chemical Sensor with Leak Position Detection
HLFSSHNN-100	LeakFilm Hydrocarbon	100 meter Hydrocarbon Sensor
HLFSSHNN-050		50 meter Hydrocarbon Sensor
HLFSSHNN-020		20 meter Hydrocarbon Sensor
HLFSSHNN-001		Custom Length Hydrocarbon Sensor
LeakFilm Connector		
HLFNCSND-005	Start Connector	Start Connector with 5 meter Lead Wire
HLFNCJND-000	Jump Connector	Cable Jump Connector with 15cm Lead Wire
HLFNCJND-001		Cable Jump Connector with 1m Lead Wire
HLFNCLND-000	Elbow Connector	Elbow Connector
HLFNCEND-000	End Connector 4 Lines	End Connector 4 Lines with Leak Position Detection
HLFNCENN-000	End Connector 2 Lines	End Connector 2 Lines

9. Warranty Statement

All products are designed and manufactured to the latest internationally recognised standards by Honeywell Analytics under a Quality Management system that is certified to ISO 9001. As such Honeywell Analytics warrants its products against defective parts and workmanship and will repair or (at its option) replace any instruments which are or may become defective under proper use within 18 months from date of commissioning by an approved Honeywell Analytics representative or 24 months from date of shipment from Honeywell Analytics, whichever is the sooner. This warranty does not cover disposable batteries or damage caused by accident, abuse, abnormal operating conditions or poisoning of sensor.

Defective goods must be returned to Honeywell Analytics premises accompanied by a detailed description of any issue. Where return of goods is not practicable Honeywell Analytics reserves the right to charge for any site attendance where any fault is not found with the equipment. Honeywell Analytics shall not be liable for any loss or damage whatsoever or howsoever occasioned which may be a direct or indirect result of the use or operation of the Contract Goods by the Buyer or any Party.

This warranty covers instrument and parts sold to the Buyer only by authorised distributors, dealers and representatives as appointed by Honeywell Analytics. The warranties set out in this clause are not pro rata, i.e. the initial warranty period is not extended by virtue of any works carried out there under.

In no event will Honeywell Analytics be liable for any incidental damages, consequential damages, special damages, punitive damages, statutory damages, indirect damages, loss of profits, loss of revenues, or loss of use, even if informed of the possibility of such damages. Honeywell Analytic's liability for any claims arising out of or related to this product will in no case exceed the order value. To the extent permitted by applicable law, these limitations and exclusions will apply regardless of whether liability arises from breach of contract, warranty, tort (including but not limited to negligence), by operation of law, or otherwise.

10. Sensor Installation Drawing

3013G0806

SHT. 1

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SCALE	DRW	Puritan Ahn	11 / Mar / 14
NONE	TITLE	LEAKFILM SENSOR&CONNECTOR INSTALLATION DRAWING	
1	ISSUE	11/Mar/14	DATE
	CHANGE	New Design	BY
	APPROVED	Jeffrey L	BY
3013G0806			SHT. 1 OF 2

FINISH

MATERIAL

ALL DIMENSIONS IN MILLIMETRES
(UNLESS OTHERWISE STATED,
AND APPLY AFTER PLATING

THIS DRAWING IS TO BS 8888

REMOVE ALL BURRS AND
SHARP EDGES

SURFACE TEXTURE VALUES ARE
IN um Ra AND TO BS 1134

FINISH

MATERIAL

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MATERIAL

TOLENCES TO BE AS SPECIFIED
BELOW UNLESS OTHERWISE STATED.

DIMS. 2 DP ±0.25 mm

NONE ±0.4 mm

ANGULAR ± 10°

Holes: □ 0 to 8 +0.08
 □ 8 to 14 +0.1
 □ 14 to 25 +0.12
 -0.0

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10. Installation Drawing

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SHT. 2

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SCALE: **NONE**

DRWN: **Puritan/Ann**

TITLE: **LEAKFILM SENSOR&CONNECTOR
INSTALLATION DRAWING**

DATE: **11/Mar/14**

ISSUE: **1**

CHANGE: **New Design**

APPROVED BY: **Jeffrey L.**

3013G0806

SHT. 2
OF 2

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MATERIAL: **LEAKFILM SENSOR&CONNECTOR**

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THIS DRAWING IS TO BS 8888

REMOVE ALL BURRS AND
SHARP EDGES

SURFACE TEXTURE VALUES ARE
IN $\mu m Ra$ AND TO BS 1134

TOLERANCES TO BE AS SPECIFIED
BELOW UNLESS OTHERWISE STATED.

DIMS. 2 DP ± 0.1 mm
1 DP ± 0.25 mm
NONE ± 0.4 mm

ANGULAR $\pm 1/2^\circ$

HOLES. \square 0 to 8 +0.08
 \square 8 to 14 +0.1
 \square 14 to 25 +0.12
 \square 25 to 50 +0.15

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Thank you for reading this data sheet.

For pricing or for further information, please contact us at our UK Office, using the details below.



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