

To: _____

Specification Document

Water Leakage Location Detector AD-AS-1LCM-A

Date:()

<Manufacturer >

System Equipment Division
Electronic Materials & System Equipment Group
TATSUTA Electric Wire & Cable Co., Ltd.

System Division		
Approved by:	Checked by:	Prepared by:

<<<Important Safety Precautions>>>



Warning

Failure to operate this water leakage location detector in compliance with the following warnings may lead to fatality, serious injury, fire, electric shock, or detector failure.



Precautions!



Strictly Prohibited!

- Never modify or disassemble this detector.
- Allow only qualified persons to carry out installation work inspection of this detector.
- Do not touch this detector with wet hands.
- When performing maintenance on this detector, wipe it with dry rags instead of using organic solvent.



Checkpoints!

- Check the rated voltage and the detector supply voltage before installation.
- When installing and making electrical connections to this detector, follow the instructions in the operation manual.
- When inspecting and carrying out maintenance on this detector, follow the instructions in the operation manual.
- When using control output contacts, check the contact rated load in the operation manual.



Do not install the detector in the following locations!

- Locations easily accessible to the general public
- Locations close to sources of vibration, organic gas or strong electromagnetic induction
- Locations subject to excessive waste and dust
- Locations where there is a possibility of exposure to water, or high temperature and humidity

Warranty

Before shipping, this product is subjected to strict quality control and inspection. In the event of spontaneous failure resulting from defective manufacturing, we will repair or replace it according to the following provisions.

Warranty Provisions

1. Warranty period (one year after the delivery date of the product)
Should the product fail during the warranty period under normal usage according to the operation manual, we will repair or replace it free of charge. Please contact us using the contact information given below.
2. Cases not covered by the warranty
 - (1) After the period of warranty
 - (2) Failures due to incorrect usage, and unauthorized repairs and modifications
 - (3) Failures or damages due to moving, dropping etc. after purchase
 - (4) Failures or damages due to fire and natural disasters
 - (5) Failures not attributable to this product
 - (6) Fees for on-site service (visiting fee and technical fee)

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1. Scope of Application

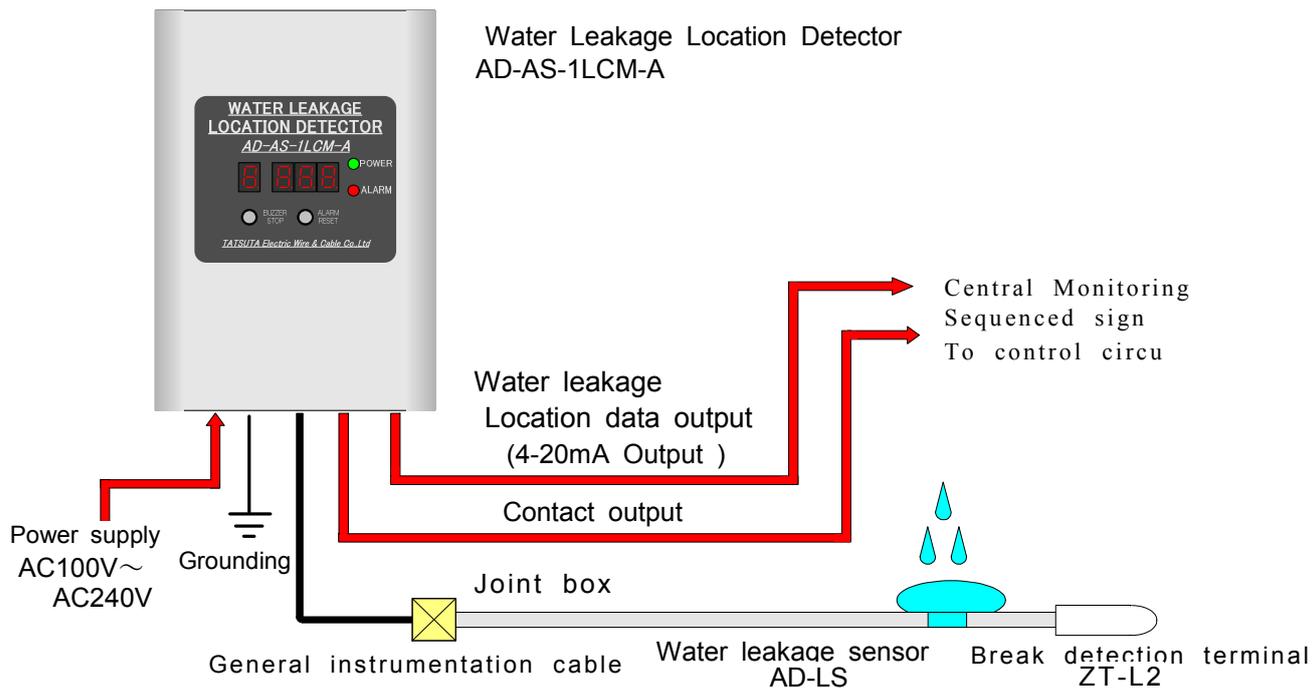
This document applies to the Water Leakage Position Detector (AD-AS-1LCM-A), which has been developed in order to protect computer rooms, important facilities and warehouses, and valuable information, etc. from damage resulting from unpredictable water leakage.

2. Structure of water leakage position detecting system

The water leakage position detecting system consists of:

- ① Water leakage position detector (AD-AS-1LCM-A)
- ② Water leakage sensor (AD-LS)
- ③ Break detection terminal (ZT-L2)

For connections on the terminal block, refer to Attached Drawing 2.



Triples, single wiring conductor: $\phi 0.8\text{mm}$ min. and 100m max. in length
 Triples, twisted wiring conductor: 0.5mm^2 min. in area and 100m max. in length

Fig-1. Detection System of Leakage Position

3. Specifications

3-1. Ratings

For ratings, see Table 1.

Table 1 Ratings

Item	Specifications
Rated voltage	AC100V~AC240V
Range of supply voltage variation	AC85V~AC264V
Power consumption	5W max.
Control output contact	*Check Subsection 3-3 Control Output Contact Specifications.
Sensor applied voltage	AC5. 5V (max.)
Working ambient temperature	0°C to 50°C (no icing)
Working ambient humidity	35%RH to 85%RH (no condensation)

3-2 Performance

For performance parameters, refer to Table-2.

Table 2 Performance

Item	Specification
Number of sensor circuits	1
Length of sensor connection	1 to 250 m
Detection sensitivity level setting	Low Standard High Highest
Water leakage detection sensitivity	10 kΩ ± 20% 25 kΩ ± 20% 50 kΩ ± 20% 100 kΩ ± 20%
Sensitivity in the case of recovery from water leakage	16 kΩ ± 20% 37 kΩ ± 20% 68 kΩ ± 20% 125 kΩ ± 20%
Detection accuracy	1 to 100 m: ± 1 m 101 to 250 m: sensor length ± 1%
Surface panel operation switch function	Buzzer stop switch: 1 Alarm cancel switch: 1
Surface panel LED indication	Power source indication, green: 1 (lighting up) Alarm indication, red: 1 (flashing in the case of water leakage detection) (lighting up in the case of break detection)
Surface panel 7-segment LED indication	Detector number indication: 1 digit (1 to 9, A, b, C, d, E and F) Sensor length and water leakage location indication: 3 digits, in meters
Surface panel operational setting switch	Used for setting change of indication, control output contacts, detection sensitivity level, etc. For details, refer to Attached Drawing 3.
Alarm buzzer	Average sound pressure: 90 dB/10 cm (catalogue value by manufacturer)
Control output contact	Contact configuration ◇ Contacts (For specifications, refer to Section 3-3.) Water leakage: 1 for 1a Break: 1 for 1a * Setting change of the operation switches shifts to Contact b.
Water leakage location data output	4–20 mA current loop output (external load resistance: 500 Ω max.) x 1 Under normal sensor conditions: 4 mA In the case of sensor break detection: 20 mA In the case of water leakage detection: 6 + 0.03 x water leakage location indication (m) mA ± 1% * Changing operational setting switches changes operation in the case of water leakage detection. (Refer to Attached Drawing 3.) In the case of water leakage detection: 16 x water leakage location indication (m) / 250 (m) + 4 mA ± 1%
Withstand voltage	AC 1500V (50/60 Hz)/1 minute (between the power source terminal and the body case)
Insulation resistance	10 MΩ min. (with DC 500V Megger)/1 minute (between the power source terminal and the body case)
Noiseproofing property	±500V Pulse width: 1 μSEC (noise simulator)/1 minute (between each phase and the grounding terminal)
Outside dimensions	W125 x H180 x D35 (unit: mm) (Refer to Attached Drawing 1.)
Weight and color	Approx. 300 g, gray

3-3 Control Output Contact Specifications

For control output contacts, refer to Table 3.

Table 3 Control Output Contact Specifications

Item	Resistance load	Inductive load
Rated load	AC125V 0.4A DC 30V 2.0A	AC125V 0.2A DC 30V 1.0A
Minimum load	DC10mV 10μA (reference value)	

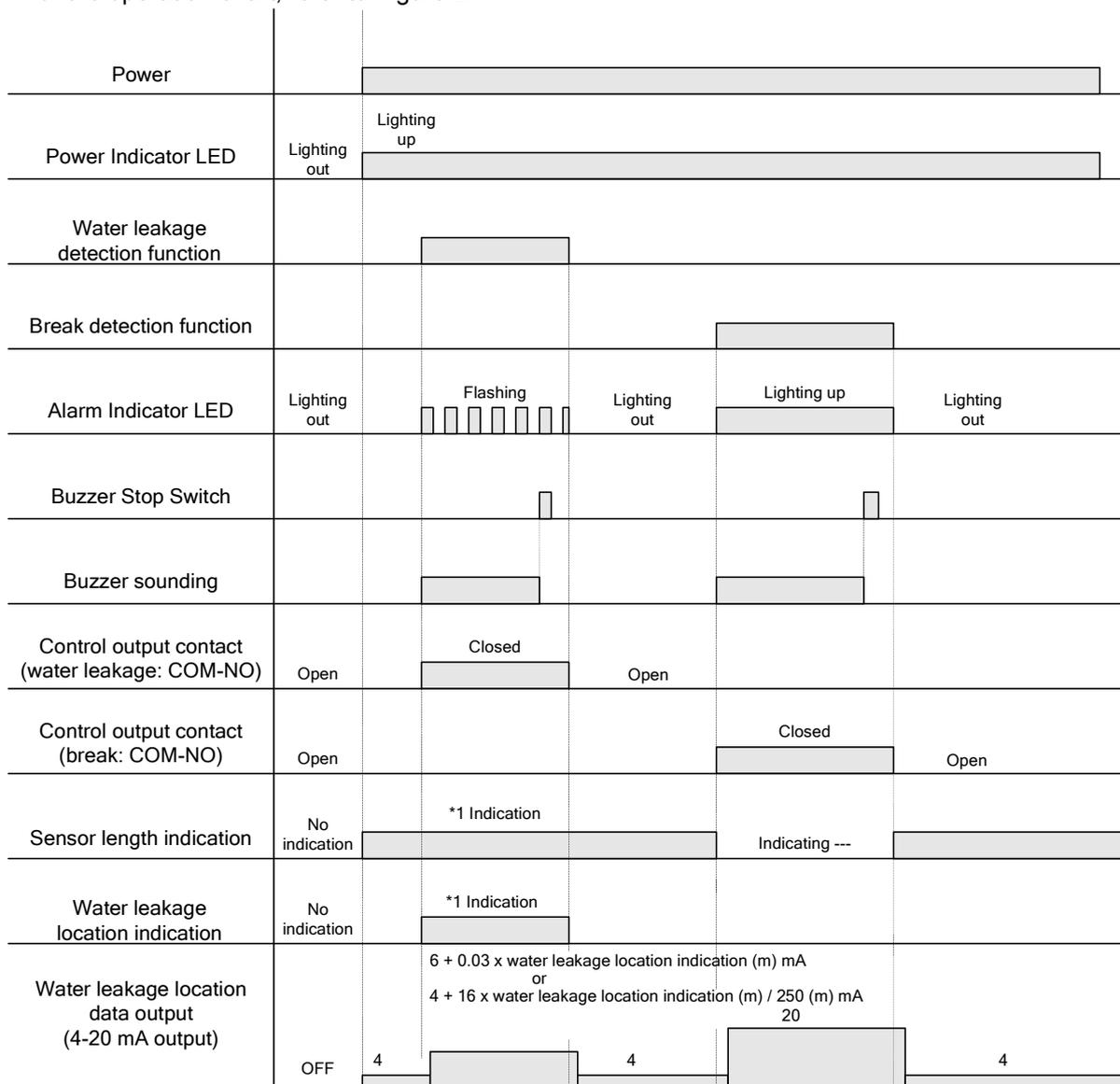
((Relay contact: G6E-134P-US Catalogue values by OMRON Corporation))

4. Operation Chart

4-1 Standard Operation Chart

(Factory setting)

For the operation chart, refer to Figure 2.



*1 The sensor length and the water leakage location is indicated alternately. Pls refer to Attached drawing 4

Figure 2 Operation Chart 1

Buzzer

Press the buzzer stop switch and the buzzer stops.

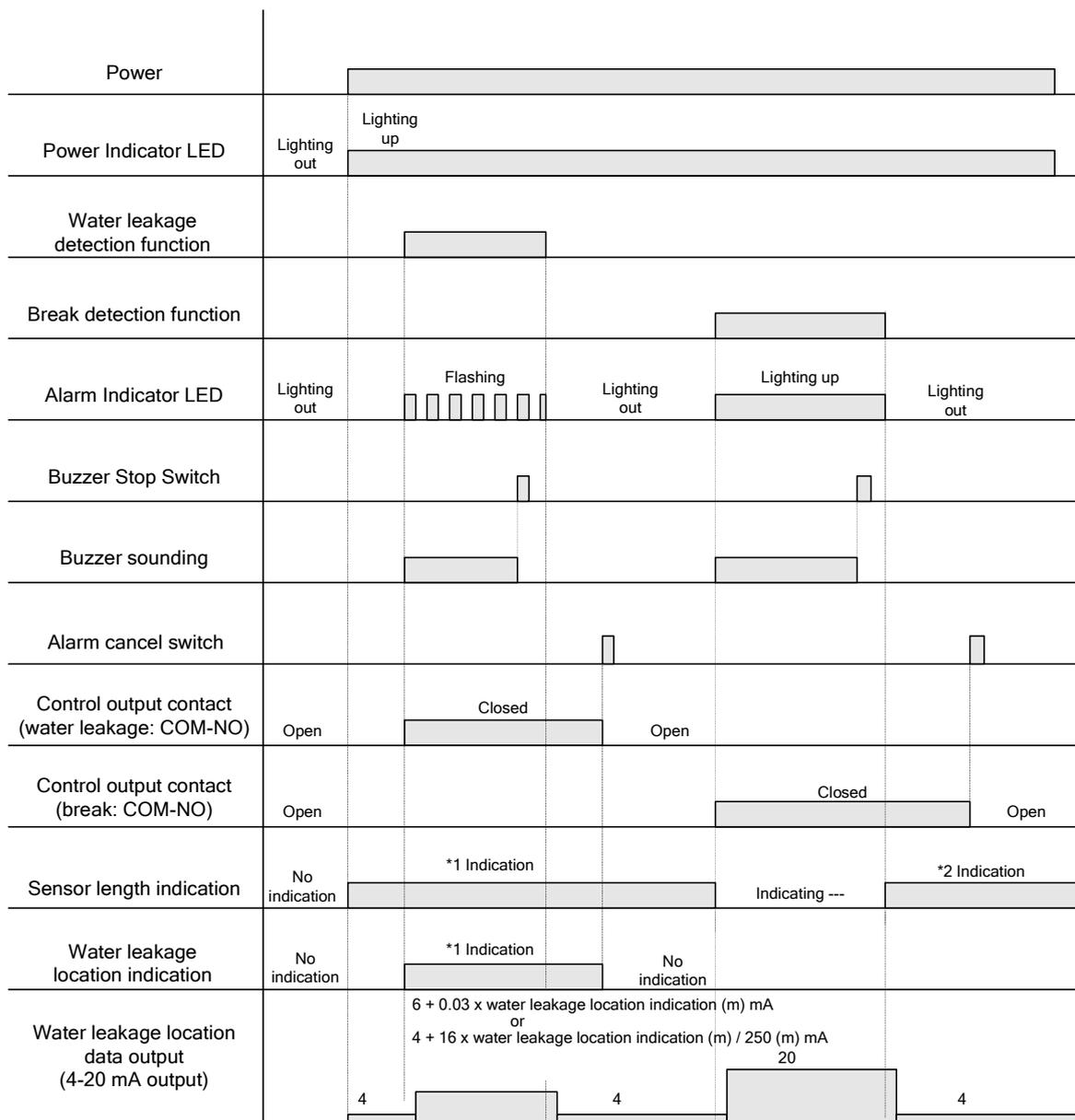
When the system detects another water leakage or a break, the buzzer sounds again.

Turning the No.1 operational setting switch ON prevents the buzzer from sounding at any time.

(Refer to Attached Drawing 3.)

4-2 Operation Chart When Alarm Hold Setting is Activated

Changing operational setting switches activates the alarm hold setting for indication and control output contacts. For the operation chart, refer to Figure 3.



*1 The sensor length and the water leakage location are indicated alternately. (Refer to Attached Drawing 4)
 *2 For the break indication, the alarm status is not held.

Figure 3 Operation Chart 2

When the alarm setting is activated, the alarm status is maintained until the alarm cancel switch is pressed. Electric power failure or power-off returns the contact operation status to that when the power source is shut off. If the alarm hold setting is not activated, refer to “Figure 2 Operation Chart-1”.

The Alarm Indicator LED does not maintain alarm status. The Alarm Indicator LED goes out when the system detects recovery from water leakage status and break status. If the Alarm Indicator LED continues to flash even after the water leakage sensor is wiped with rags etc., this indicates that water leakage may occur at multiple locations.

After completely drying the water leakage sensor at the location that the indicator displays, press the alarm cancel switch.

*If drying is insufficient, deviation may occur between the location displayed by the indicator after the alarm cancel switch is pressed and the actual water leakage location.

5. Installation

The Water Leakage Position Detector (AD-AS-1LCM-A) shall be securely installed in a strong housing, on the wall, etc. inside a building.)

Be sure to follow the instructions below when installing this product.

- 1) Avoid installing the detector in any location subject to high temperature and high humidity, excessively dusty environments and corrosive gas environments.
- 2) Install the detector in a location that is free from vibration, away from sources of noise such as power switches, and convenient for quick maintenance and inspection.
- 3) Install the sensor using adhesive stickers, pin saddles, etc. according to location and environment.
- 4) Consult the manufacturer in any case where there is a possibility of noise contamination, including electromagnetic induction, to the sensor.
- 5) Do not insert foreign matters, including drivers, into gaps in the detector.
- 6) Do not use the sensor as electric wire.
- 7) Never use sensors other than our product "AD-LS Sensor." This will cause serious errors in the location detection function. So make sure not to use or use at same time the sensor other than AD-LS sensor.

6. Water Leakage Sensor (AD-LS Sensor)

The structure and configuration of the Water Leakage Sensor (AD-LS Sensor) used for the Water Leakage Location Detector (AD-AS-1LCM-A) are shown in Drawing 4 and Table 4.

Each wire has different characteristics and function, so care should be taken when connecting to the detector.

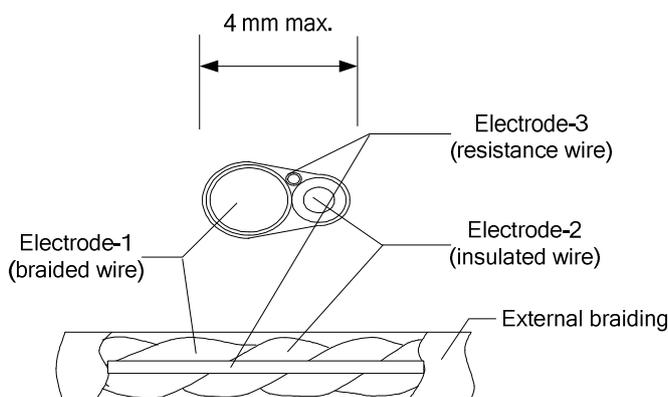
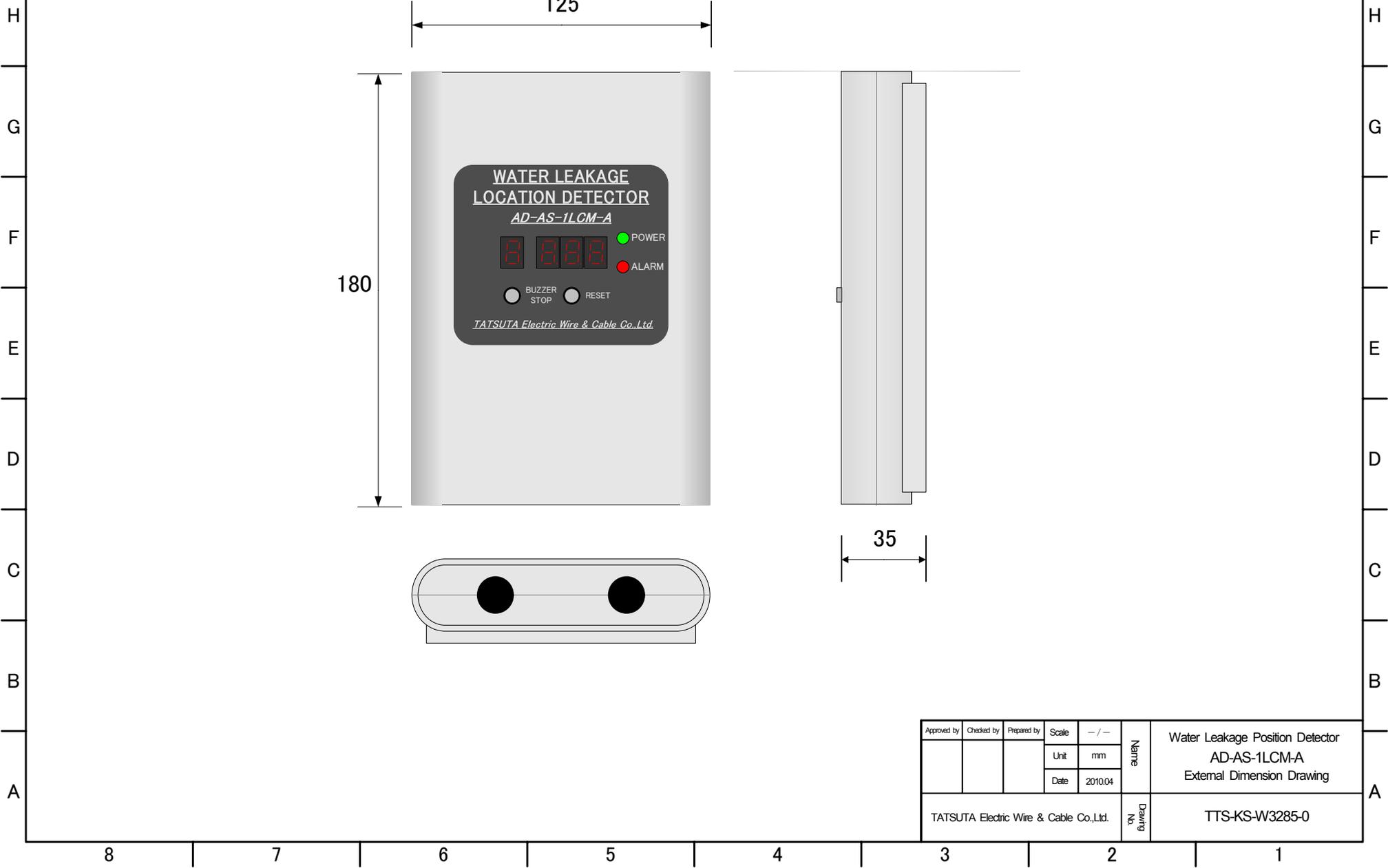


Figure 4 AD-LS Sensor Structure

Table 4 AD-LS Sensor Configuration

Element	Configuration
Electrode 1	0.33-mm ² tinned soft copper wire covered with red plastic braided thread
Electrode 2	0.5-mm ² tinned soft copper wire insulated with green plastic
Electrode 3	φ0.4 resistance wire covered with white plastic braided thread
Outer braiding	White plastic braided thread

Attached Drawing-1



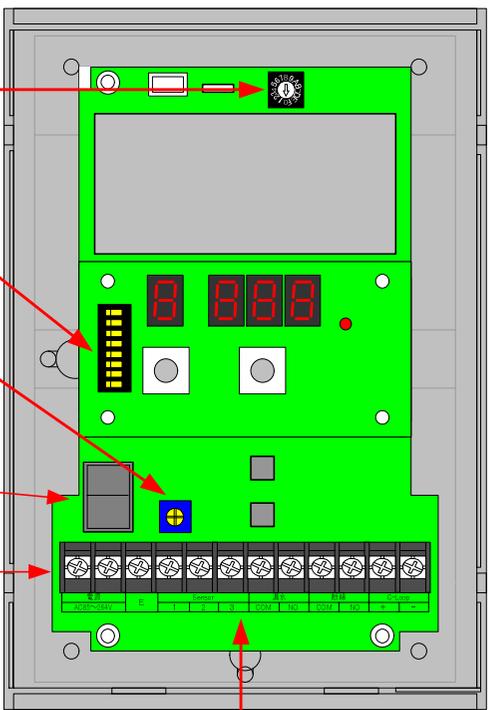
Approved by	Checked by	Prepared by	Scale	--/--	Name	Water Leakage Position Detector AD-AS-1LCM-A External Dimension Drawing
			Unit	mm		
			Date	2010.04		
TATSUTA Electric Wire & Cable Co.,Ltd.					Drawing No.	TTS-KS-W3285-0

Attached Drawing-2

8 7 6 5 4 3 2 1

H
G
F
E
D
C
B
A

- Detector Number Setting Switch
- Action Setting Switch
- Detection Precision Adjusting
*Please don't change the factory setting.
- Power Switch
- Terminal Block (M3)



- Detector Number Indication
- Sensor Length
- Water Leakage Location Indication Part
- Power Indicator LED
- Alarm Indicator LED
- Alarm Cancel Switch
- Buzzer Stop Switch

Power supply	E	Sensor AD-LS			Water leakage contact (*1a Contact)		Break Contact (*1a Contact)		4-20mA Output	
		Grounding	Braiding wire	Insulated wire	Resistance wire	C	N	C	N	+
AC85V~ AC264V					C O M	N O	C O M	N O	+	-

Approved by	Checked by	Prepared by	Scale	--/--		Name	Water Leakage Position Detector AD-AS-1LCM-A Parts Instruction
			Unit	mm			
			Date	2010.04			
TATSUTA Electric Wire & Cable Co.,Ltd.						Drawing No.	TTS-KS-W3286-0

8 7 6 5 4 3 2 1

Attached Drawing-3

1	<input type="checkbox"/>	<input type="checkbox"/>	NO
2	<input type="checkbox"/>	<input type="checkbox"/>	
3	<input type="checkbox"/>	<input type="checkbox"/>	
4	<input type="checkbox"/>	<input type="checkbox"/>	
5	<input type="checkbox"/>	<input type="checkbox"/>	
6	<input type="checkbox"/>	<input type="checkbox"/>	
7	<input type="checkbox"/>	<input type="checkbox"/>	
8	<input type="checkbox"/>	<input type="checkbox"/>	

No	Factory setting	Action Instruction
1	OFF	Buzzer sounding OFF : Action ON : Inaction
2	OFF	Water leakage position indication, Alarm holdin OFF : No ON : Yes
3	OFF	Water leakage and break relay, OFF : No ON : Yes
4	OFF	Water leakage relay, Contact "a" and Contac OFF : Contact "a" ON : Contact "b"
5	OFF	Break relay, Contact "a" and Contact "b" action OFF : Contact "a" ON : Contact "b"
6	OFF	4-20mA Action OFF In case of water leakage detection:: $6+0.03 \times \text{Water leakage position indication (m)}$ mA e.g.:Water leakage location: 100m: $6+0.03 \times 100 = 9\text{mA}$ ON In case of water leakage detection:: $4+16 \times \text{Water leakage position indication (m)}/250$ mA e.g.:water leakage location 100m: $4+16 \times 100/250 = 10.4\text{m}$
7	OFF	Detection precision switchover (7) (8) OFF - OFF Standard precision Approx. 25kΩ ON - OFF Low precision Approx. 10kΩ
8	OFF	OFF - ON High precision Approx. 50kΩ ON - ON Highest precision Approx. 100kΩ

*Changing switch status leads to corresponding change of such as operations as indication and
Please note that the change to non-function status will lead to no corresponding operation.

Approved by	Checked by	Prepared by	Scale	- / -	Name	Water Leakage Location Detector AD-AS-1LCM-A Instruction of Action Setting Switch
			Unit	mm		
			Date	2010.04		
TATSUTA Electric Wire & Cable Co.,Ltd.					Drawing No.	TTS-KS-W3287-0

Attached Drawing-4

Indication In Case of Normal Sensor Operation



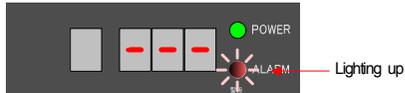
In case of normal sensor operation

Sensor Length Indication



Alarm Indicator LED State ● Lighting out

Indication In Case of Break Detection



In case of Break Detection

Break Indication



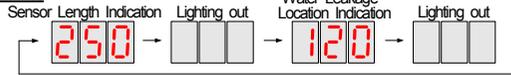
Alarm Indicator LED State ● Lighting up

Indication In Case of Water Leakage Detection



Sensor length indication in case of lighting out
Water leakage location indication in case of light flashing

In case of water leakage detection

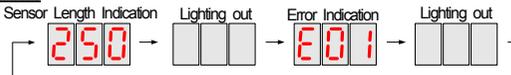


Alarm Indicator LED State ● Lighting off ● Lighting out ● Flashing ● Lighting out

Water Leakage Position Data Output Abnormality Indication

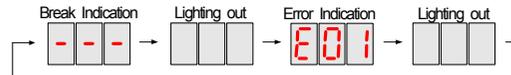


In case of normal sensor operation



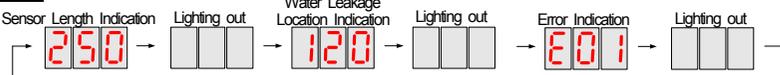
Alarm Indicator LED State ● Lighting out ● Lighting out ● Lighting out ● Lighting out

In case of Break Detection



Alarm Indicator LED State ● Lighting up ● Lighting up ● Lighting up ● Lighting up

In case of water leakage detection



Alarm Indicator LED State ● Lighting out ● Lighting out ● Flashing ● Lighting out ● Lighting out ● Lighting out

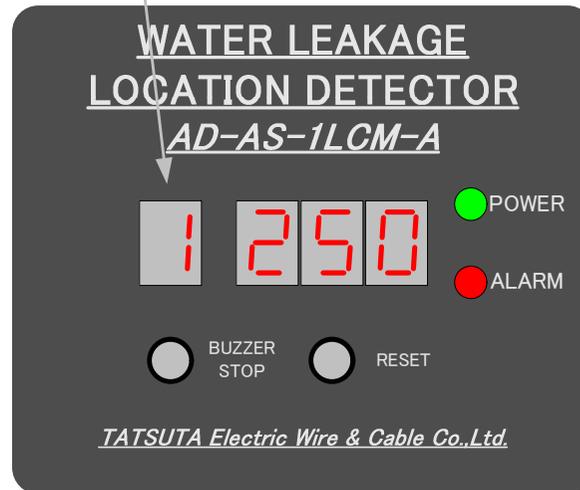
- The [E01] indication is added now.
- ①When the wiring between external analog input devices of the detector is disconnected or the input resistance is over 500Ω;
 - ②Failure of the internal electric source of the detector for 4-20mA output.

Approved by	Checked by	Prepared by	Scale	- / -	Name	Water Leakage Position Detector AD-AS-1LCM-A Indication Part Instruction-1
			Unit	mm		
			Date	2010.04		
TATSUTA Electric Wire & Cable Co.,Ltd.					Drawing No.	TTS-KS-W3288-0

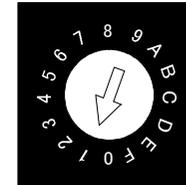
Attached Drawing-5

Dectector Number Indication

Dectector Number Indication



Detector Number Setting Switch



In case of using multiple detectors, it is necessary to make related settings for detector number indication.

Rotate detector number setting switch and select the desired number.

The detector number is displayed on left-most 7-digit LED (1~9,A,B,C,D,E,F)

*The factory setting is 0 (no indication).

Approved by	Checked by	Prepared by	Scale	— / —	Name	Water Leakage Position Detector AD-AS-1LCM-A Indication Part Instruction-2
			Unit	mm		
			Date	2010.04		
TATSUTA Electric Wire & Cable Co.,Ltd.						TTS-KS-W3289-0