

As a leading manufacturer of Water Leak Detection Systems, TTK is delighted to present a comprehensive test procedure designed for indoor environments.

Enclosed herewith is the detailed procedure tailored for high-level CHW (Chilled Water) Pipes, Condensate Pipes, and Refrigerant Pipes. We invite you to explore the meticulous steps outlined below to ensure the efficacy and reliability of your TTK Water Leak Detection Systems.

1 Prerequisites

According to the FM approval standard FM7745 "Examination Standard for Liquid Leak Detectors" version of September 2021, point 3.2.11: "Sensing cables used for nonstandard protection alarm times must respond with 3 feet (1 meter) or less of wetted cable length", the presence of water is considered unexpected and classified as a leak once it extends to a minimum length of 1 meter.

TTK has developed a technical solution to accurately detect water leaks along CHW pipes, minimizing the occurrence of nuisance alarms caused by condensation, utilizing two water leak sense cables from TTK with reference names FG-ECS and FG-ECSB (Braid).

Below are essential guidelines for conducting a leak test using FG-ECS and FG-ECSB sense cables:

- The water temperature for testing purposes should be within **10°C and 40°C**.
- The water to be detected must be **conductive** (not less than 700µS/cm). Avoid the use of distilled water.
- Ensure that the TTK monitoring control panel recognizes the FG-ECS and FG-ECSB sense cables.
- Addressable modules with reference name FG-DCTL, typically positioned every **35 to a maximum of 45 meters**, monitor FG-ECS and FG-ECSB cables, adhering to manufacturer recommendations.
- Secure the FG-ECS and FG-ECSB sense cables at the **6 o'clock position** below the pipe, centered under the pipe.
- Use cable ties to fasten the cables every 30 cm, ensuring the sense cables maintain contact with the CHW base. The use of **Velcro or fabric cable ties** can enhance detection efficiency.

2 Detection Tests

1. Water Immersion Test Conducted During Installation

Throughout the installation process, we advise verifying each cable by submerging it in water.

FG-ECS SENSE CABLE

- Immerse a total of **20 cm** of the sensing cable completely in water for a duration of 10 to 15 seconds.
- The reaction time should be under 55 seconds.

FG-ECSB SENSE CABLE

- Immerse a total of **15 cm** of the sensing cable completely in water for a duration of 10 to 15 seconds.
- The reaction time should be under 55 seconds.

2. Leak Detection Test on CHW Pipes Post-Installation

After installation, and to simulate "real test conditions", we advise conducting the following tests:

FG-ECS SENSE CABLE

- Pour 500 ml of water onto the pipe in a quick and uniform manner over a distance of **70 cm**.
- The reaction time should be under **55 seconds**.

FG-ECSB SENSE CABLE

- Pour 500 ml of water onto the pipe in a quick and uniform manner over a distance of **50 cm**.
- The reaction time should be under **30 seconds**.

The information provided in this document constitutes recommendations that must be adhered to optimize the functionality of the TTK system. The detection delay and the length of sensing cable in contact with water may vary depending on environmental conditions, humidity, temperature, capillarity, water propagation along the pipe and cable, water conductivity, and other factors.

3 Annex

1. Sense Cable Attachment Techniques: Proper vs. Improper Methods for Maintaining Contact with Pipe Base

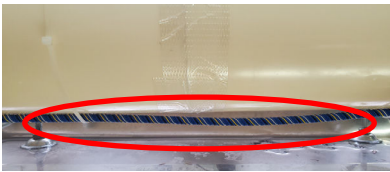
■ FG-ECS SENSE CABLE

Proper Method



The cable is neatly and securely attached on the pipe base.

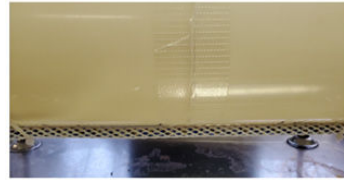
Improper Method



There is a gap between the cable and the pipe base.

■ FG-ECSB SENSE CABLE

Proper Method



The cable maintains consistent and close contact with the pipe base.

Improper Method



Poor contact between the cable and the pipe base.

2. Sense Cable Position Techniques: Proper vs. Improper Methods for Positioning Cable at 6 O'clock Below the Pipe (Centred Under the Pipe)

■ FG-ECS SENSE CABLE

Proper Method



The sense cable is fastened at the 6 o'clock position beneath the pipe, positioned centrally under the pipe.
(The photo is captured from beneath the pipe)

Improper Method



The sense cable is fastened on the side of the pipe base.

■ FG-ECSB SENSE CABLE

Proper Method



The sense cable is fastened at the 6 o'clock position beneath the pipe, positioned centrally under the pipe.
(The photo is captured from beneath the pipe)

Improper Method



The sense cable is fastened on the side of the pipe base.

3 Annex

3. Water Pouring Technique: Applying 500 ml of Water onto the Pipe

- Water Pouring Technique

FG-ECS SENSE CABLE



Pour 500 ml of water onto the pipe in a quick and uniform manner over a distance of **70 cm**.

FG-ECSB SENSE CABLE

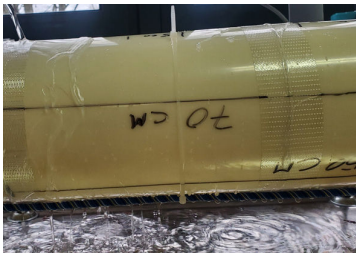


Pour 500 ml of water onto the pipe in a quick and uniform manner over a distance of **50 cm**.

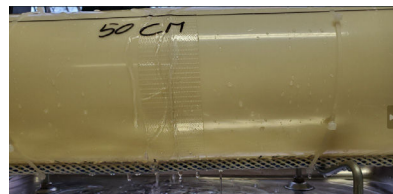
4. Water Flow

- Water flows along the pipe that passes over the cable

FG-ECS SENSE CABLE



FG-ECSB SENSE CABLE



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