TOTAL SOLUTION FOR FIRE PREVENTION AND CONTROL

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KUNKOOK ENGINEERING INSTITUTE INC.

INTRODUCE

••• We are one of the leading companies of providing Fire Protection System manufacturing, engineering, construction and consulting, established in Korea since September 1996. KunkooK Engineering & Institutes Inc.(KIE) is based in Seoul, South Korea, and has a team of expert personnel who can relate to every aspect of fire suppression. For 15 years, KEI has been providing solutions and developing the new products to the most complex fire protection challenges in most every industry. KEI has adopted new visions for the 21st century.
Its new visions are to develop a corporation where employees reach their full potential and consumers are satisfied and touched emotionally.The team at KIE have a wealth of experience in providing design, guidance and technical knowledge regarding the uses of LeakAlarm, Water Mist Systems and Fire Alarm system Engineering. This has been gained from working all over the nation on some of the largest construction projects to date. Now we are going to all over the world market.Through continued investment and research & development KEI Researching Lab brings to the world market the Leakalarm, water mist system and so on. Put our experienced engineering and design team to work protecting you and your business. Our experienced staff of PE certified designers and professional engineers are focused on industrial hazards and can provide a complete range of services.

CEO Jung Yeul, Park *Jungyeal, Park.*

KEI can do it all

- Fire sprinkleer system
- Special hazard fire suppression systems
- Fire detection and alarm systems
- Security systems
- Gas detection systems
- Healthcare communication systems
- Engineering, consulting, construction managements, offering, constructions and installing all of these systems

Specialist in fire control for any building and plants

Application Engineering

••• Put out experienced engineering and design team to work protecting you and your business. Our experienced staff, designers and professional engineer are focused on industrial on hazards and can provide a complete range of service including:

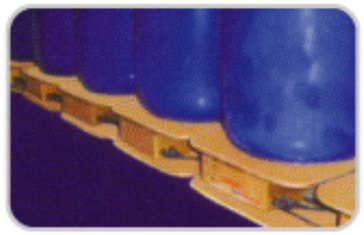
- Audits and Survey
- Fire Protection Master Plans
- Code Analysis/Negotiation
- Hazard Analysis & Classification
- CAD and drafting services
- Retrofits and Modernization plans
- Systems Design

Systems. Solutions. Service

••• Our engineers systemijes to meet your design specifications, to protect your property and your employees - we have a commitment to safety. Contact us today to learn more about our products and services!

LeakAlarm™

The LeakAlarmTM is for the detecting and the alarm system of the extinguisher agent, especially liquid state of clean fire extinguishing agent such like HFC-227ea, HFC-23, HFC-125, NOVEC and so on, to solve the leakage of small quantities of gaseous agent. The LeakAlarmTM is able to detect and to monitor the leakage of extinguishing agent by total weight of cylinder and agent weight.



Monitoring Diagram

- Weighting Range of Cylinder : 5Kg ~ 250Kg (including agent weight)
- Alarm Setting Range by weight : 2Kg ~ 20Kg (depend on user)
- Monitoring Method for the computer : RS485 Communication by Loop
- Monitoring Program : A custom-built by user interface
- Feature : Single Device Operation(Programming and alert)
- Monitoring System : Weight status of each cylinder show and alert on the CRT

Monitoring

Display on 50kg of agent weight

- Discharge
- Precaution
- Normal

Load CellAmp function

How to set up the point

First pressing of M button

T is coming out and T means Total (impossible of point changing)

Second pressing of M button

C is coming out and C means Cylinder with Cylinder weight indication
Using for removal of unessential part (Normally, indicating of ruling out C weight)

Third pressing of M button

L is coming out and L means Leak (Loosing Minutely of objection weight)

Fourth pressing of M button

O is coming out and O means Out (Loosing wholly of objection weight)

Fifth pressing of M button

D is coming out and D means Duration(Warning time)

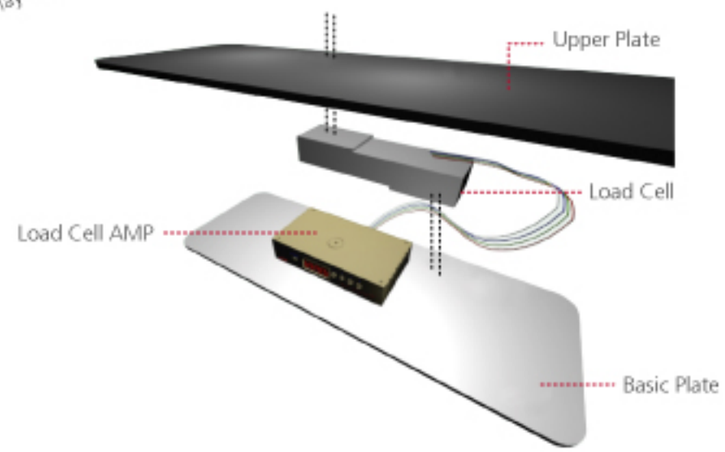
T (TOTAL)	Total Weight
C (CYLINDER)	Not measuring weight
L (LEAK)	Minutely leaking
O (OUT)	Wholly leaking
D (DURATION)	Warning time
L	Load cell type
N (Number)	Load cell address

EX) Assumption of total weight 115kg and Cylinder Weight 70kg Catching the leakage in 40kg weight of measuring objection and in the case for catching the leakage 10 kg weight, set ip up as bellows,

It is impossible to T to set up. C is set with 70kg (indicating with 45 point)
L with 40kg and o is set up. C is set with 70kg (indicating with 45 poing)

Contents of Leak Alarm

••• LeakAlarm consist if LoadCell, Up and down Steal plate of Load cell Amp




Adapter


Load Cell Amp


Terminal Block


Plates


Load Cell

Intended use for Leak Alarm

••• It ti to measure weight of gas volume in the Cylinder by using Load cell for prior recognition of gas leakage which is caused by minute crack in Cylinder or poor of connection on purpose of safely managing for 24 hours.

Caution

- Install the equipment in safe area.
- Install the equipment in a clean, dry and well ventilated area.
- Store the equipment in temperature of 5-35 degree (50-140F), humidity 0-80% Please be cafeful not to drop equipment or avoid strong impact to equipment.
- Please don't attempt to maintain, disassembly and modify without prior approval of designated responsible person by Kunkook Engineering & Institute Inc.

Caution for installation

- If you are not sure of the type of power supply to your offices, consult your local power company (refer to standard of power supply)
- It is capable for 16 piece of load cell to one power supply, maximum 32 piece at once with adding power supply.
- In requirement of operation with over than 32 piece of Load cell, it is in need of Buffer
- Please be careful to connect circuit terminal with right way
- If there is damage in circuit terminal or heat up on it, Please stop connecting circuit terminal and then check it
- As ground connection is already performed in Amp case, Don't need to do it separately
- Please check environment condition for operation

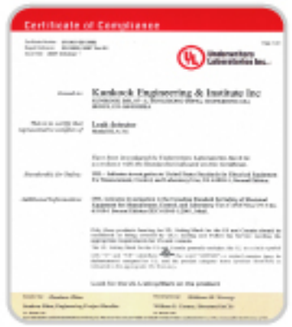
Environmental conditions

Normal environmental conditions:

- Indoor use only
- altitude up to 2,000m
- temperature 5 to 35 degree
- maximum relative humidity 80%
- MAINS supply voltage flucuations up to +−10% of the norminal voltage
- Transient overvoltages typically present on the MAINS supply (overvoltage category II)
- Rated Pollution degree II
- Ingress of liquid protection :IP XO

Warning

If equipment is modified and maintained without approval of designated responsible person by Kunkook Engineering & Institute Inc.

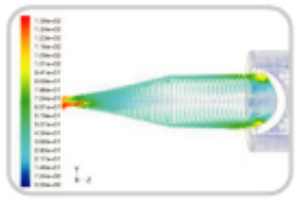

Certificate of Compliance

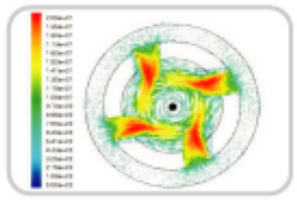
MicroWater™ Nozzle

●●● We develop the new watermist nozzle of high and middle pressure having a high efficiency extinguishing

Specification

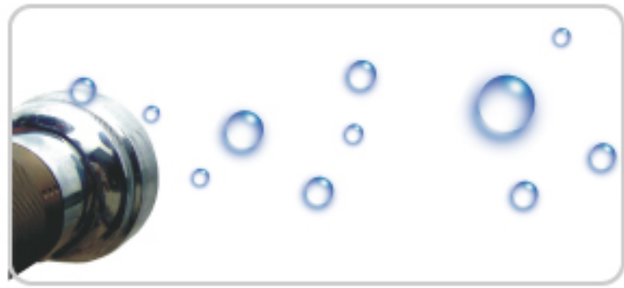
Low & Middle pressure nozzle	High pressure nozzle
- Drop size : SMD 120 um	- Drop size : SMD 50~60 um
- Size of nozzle Hole : 3 mm	- Size of nozzle Hole : 0.8 mm
- Working Pressure : 13~15 bar	- Working Pressure : 80 bar
- Discharge Angle : 85 degree	- Discharge Angle : 87 degree
- Flow Rate : 6 lpm/ea	- Flow Rate : 1~2 lpm/ea





MicroWater™ Water Mist Gun

●●● The system have a pump, tank, engine, horse, light and gun. It is easily move to needing area.



Features

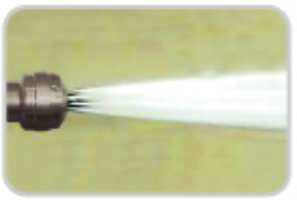
- Injection pattern : 3~5 patterns
- Pump capacity : 30 lpm
- Fuel Alarm
- Easy maintenance
- Head Light (top and buttom)

Application Field

- Semi-conductor Factory
- Computer & Telecom room
- Transformer room & out-door transfomer
- Engineroom of ship & mecanical facilities
- Train & Broadcasting fcilities

1. spray pattern

2. spray pattern



3. spray pattern

4. spray pattern

MicroWater™ Water Mist Ball

Water Mist Ball

The Water Mist Ball is for the fire fighting device,
using in water mist technologies, to throw and to use in the underground space,
the small area(difficult to approach). It is very useful and easy using by fire fighter.

Water Mist Ax

The Mist Ax to extinguish for car, blocked area, cabinet,
panel and etc. fire by throwing on the ax type nozzle having the mist spray
nozzles and the mist jet nozzle.

Application

- Car Engine Fire
- Container Fire
- Steel Cabinet Fire
- Duct Fire

MicroWater™ Mobile System

••• The MicorWaterTM Mobile system is designed to extinguish fires in various hazards using a limited quantity of water, as compared to standard sprinkler systems.
The water is discharged through specifically engineered nozzles that create a very fine droplet size.

Specification

- Engine Pump : 30 lpm, at 100 bar
- Water Tank Capacity : 200 Liter
- Hose Length : 20 ~ 100 Meter
- Fuel Alert, Pressure Indicate Function, Etc.
- Connect to fire hydrant (for water supply)

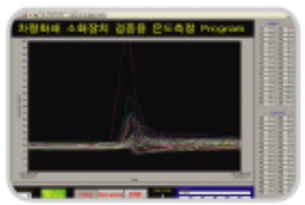
Extinguishing Ability Test

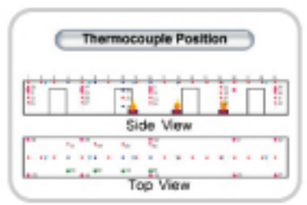
MicroWater™ is for train or metro system.

In coordination with Korea Railroad Research Institutes,
we take charge of the planning and layout of the fire protection systems for Korea Subway vehicles,
and if required, we perform real fire tests at subway cabins tests in KRRI laboratories on true-to scale models.
It is first time developed in water mist system for train in Korea by KEI.

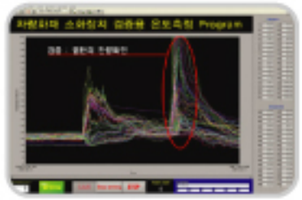
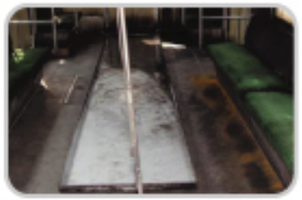
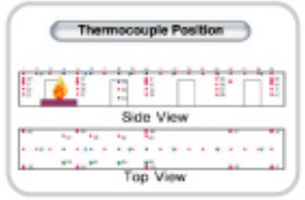
Fire Detection and Water Mist Device Control System

Case 1. Normal Heptanes Fire Test (Pan size---)



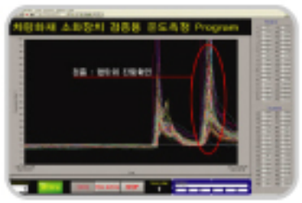


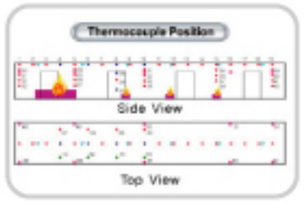
Full Scale Fire Test in Train(Cabin)

A typical MicroWaterTM system for train consists of the following main components:

- MicroWaterTM pump unit
- MicroWaterTM spray Nozzle or mist nozzle heads
- Stainless steel tubing: 12 mm to 38 mm
- Section valves, Water supply, Fire detection system





MicroWater™Mobile System

Shell type Water Curtain Nozzle

- Operation Pressure : 8Kg/cm2
- Flow Rate : 284 lpm @ 8bar
- Spray Angle : 117 degree
- Discharging Height : 7.25 meter

Strait type Water Curtain Nozzle

- Operation Pressure : 8Kg/cm2
- Flow Rate : 12.3 lpm @ 8bar
- Spray Angle : 2 degree
- Discharging Height : 7.25 meter

Low Pressure Mist Nozzle

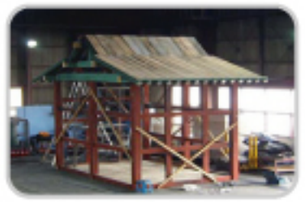
- Nitrogen Driven Pump (with Assy')
- Early Fire Detection and Suppression
- Applying with wooden temple, heritage

Low Pressure Water Mist Package

- Nitrogen Driven Pump (with Assy')
- Early Fire Detection and Suppression
- Applying with wooden temple, heritage

Installation Case of Strait type Water Curtain Nozzle

Installation Case of Shell type Water Curtain Nozzle

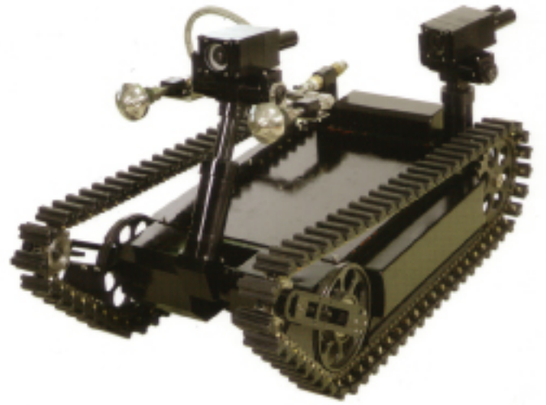


Mock-up for Fire Test

Full Scale Fire Test

Mist Package Installation

MicroWater™Mobile System



Safely extinguish fire and search people at the dangerous place such as cave, underground railway and etc.

Specification

- Dimensions: 870mm(L) 540mm(W) 240mm(H)
- Weight: 40kg
- Speed: 3.4km/h
- Operating Time: 1hrs

Major Features

- Fire Fighting: Watermist gun
- Pan tilt: 3DOF
- Stair climbing
- Camera: Thermal Image Camera
- R.F Trans. Range: 1km
- Cable control: 100m