

Applications in Gas Market and
Introduction to Gas Detectors and
Alarms for Safety and Security

Document contents

- **About Riken Keiki**
- **Why do we need gas detectors?**
Risks associated with toxic gases
- **Applications in gas market**
- **Major examples of accidents**
- **Product information**
- **International agents**

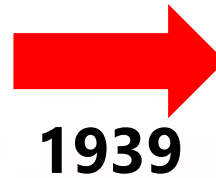


About Riken Keiki

About Riken Keiki



RIKEN



1939

Riken Keiki



Headquarters

**To be completed in September
2018 (conceptual drawing)**

Riken Keiki was originally established to commercialize and sell detectors for preventing explosions in coal mines and on oil tankers.



About Riken Keiki



**Methane gas measurements
in coal mine**



**Optical Gas
Indicator Model
3 (1939)**



Company profile



Company name	Riken Keiki Co., Ltd.	
Established	March 15, 1939	
Location	Headquarters:	2-7-6 Azusawa Itabashi-Ku, Tokyo
	Development Center:	2-3 Minamisakae-cho, Kasukabe-shi, Saitama
Factories	Hakodate-shi, Hokkaido; Sakurai-shi, Nara (affiliated company)	

Headquarters



**To be completed in September 2018
(conceptual drawing)**

Development Center



About Riken Keiki



Headquarters (Itabashi-Ku, Tokyo)



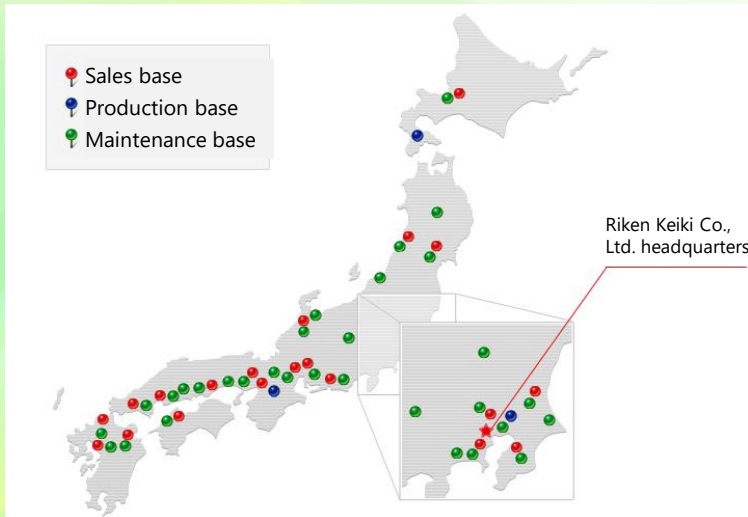
To be completed in September 2018
(conceptual drawing)

Development Center (Kasukabe-shi, Saitama)



Locations of sales offices ◆ Domestic ◆

◆ Global ◆



Company profile



Various bases	Domestic sales and branch offices: 20 locations Service stations: 32 locations Global bases: 7 locations
Major sales items	Combustible gas detectors and alarms Gas detectors and alarms designed to prevent oxygen deficiency accidents Toxic gas detectors and alarms Combined gas detectors and alarms Various measuring instruments for environmental measurements and other instruments
Capital	2,565.5 million yen
Number of employees	965 (non-consolidated), 1,127 (consolidated) * As of September 30, 2017

Hakodate Factory
(Hakodate-shi, Hokkaido)



Nara Factory
(Sakurai-shi, Nara)



Company history



1939	Riken Keiki Co., Ltd. established to produce and sell optical gas detectors, photoelasticity apparatuses, and other precision instruments invented and developed by RIKEN
1959	Start production and sale of combustible gas alarms and detectors (catalytic combustion type).
1967	Start production and sale of oxygen measuring instruments (OX-1).
1970	Start production and sale of monitoring tape type measuring instruments (FP-200).
1972	Start production and sale of non-dispersive infrared measuring instruments (RI-550).
1975	Start production and sale of electrochemical type measuring instruments (EC-231).
1986	Start production and sale of photoemission yield spectrometers (AC-1).
2009	70th anniversary of founding
2014	Start production and sale of portable X-ray diffractometers equipped with XRF (DF-01).
2015	Start production and sale of portable multi gas detectors (GX-6000), first product of its kind in Japan capable of housing photoionization detectors (PID).



RIKEN KEIKI

Why Do We Need Gas Detectors? Risks Associated with Toxic Gases

Need for gas detectors (combustible gases)

- **Criteria set by United Nations' Globally Harmonized System of Classification and Labelling of Chemicals (GHS)**

According to the United Nations' Globally Harmonized System of Classification and Labelling of Chemicals (GHS), a combustible gas (or flammable gas) is defined as follows:

A combustible or flammable gas is a gas having an explosive (flammable) range when mixed with air under atmospheric conditions of 20°C and standard pressure of 101.3 kPa.

Gases falling under this definition are further subdivided into the following two categories based on the severity of the associated risk:

Category 1 (Danger: Extremely flammable gas)

Gases capable of igniting at 20°C and standard pressure of 101.3 kPa when occurring in a mixture of 13% or less by volume with air or having an explosive (flammable) range of at least 12% when mixed with air regardless of the lower explosion (flammable) limit

Category 2 (Warning: Flammable gas)

Gases, other than those in Category 1, which are gaseous at 20°C and a standard pressure of 101.3 kPa and have an explosive (flammable) range when mixed with air



We need gas detectors because flammable gas leaks can lead to explosions.

Need for gas detectors (definition of permissible concentration)

● Definition of permissible concentration

Even when workers are exposed to hazardous substances at work sites, no adverse health effects should emerge as long as the airborne concentration of the **hazardous** substance remains below the permissible concentration.

Recommended permissible concentrations have been set by the American Conference of Governmental Industrial Hygienists (ACGIH) and the Japan Society for Occupational Health. We use the **ACGIH** permissible concentrations.

● Types of permissible concentrations

• TWA (Time Weighted Average)

Time Weighted Average refers to time-weighted average concentrations over an 8-hour workday and 40-hour workweek of routine work to which workers may be repeatedly exposed without adverse health effects.

• STEL (Short Term Exposure Limit)

Short Term Exposure Limit refers to exposure that does not lead to adverse health effects if each exposure does not exceed 15 minutes, the number of daily exposures does not exceed four, and the exposures are separated by at least one hour.

• C (Ceiling value)

Ceiling Value refers to the upper limit that can never be exceeded.



We need gas detectors because leaks exceeding permissible concentrations can lead to accidents.

How human body reacts to oxygen-deficiency

O2 Concentration
21%



Symptoms
Natural air

O2 Concentration
18%



Symptoms
Limit level for not causing serious health problems. Continuous ventilation is required



O2 Concentration
16% - 12%

Symptoms
Rapid breathing,
Increase in pulse rate,
Loss of concentration,
Headache, Nausea,
Ear ringing



O2 Concentration
14% - 9%



Symptoms
Stupor, Headache,
Nausea, Cyanosis,
Faintness on the entire
body

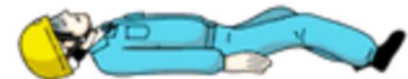
O2 Concentration
10% - 6%

Symptoms
Comatose, Loss of consciousness,
Muscle spasm on the entire body



O2 Concentration
6% or less

Symptoms
Unconsciousness, Comatose,
Cessation of breathing,
Cardiac arrest, Die in 6 minutes



Effects of hydrogen sulfide (H₂S) on human body

Concentration (ppm)	Effects and Toxicity
0.025	Smell vaguely. (It varies according to the individual.)
0.3	Smell clearly.
3 - 5	Smell moderate degree of objectionable odor.
10	Lower-level to irritate eyes' mucus membranes.
20 - 40	A strong odor. Lower-level to irritate lungs' mucous membranes.
100	Sense of smell is impaired in 2 - 15 minutes. Eyes and respiratory tract are irritated in 1 hour. 8 - 48 hours continuous exposure can lead to death.
170 - 300	1 hour exposure is the limit for not causing serious health problems.
400 - 700	Life-threatening exposure in 0.5 - 1 hour.
800 - 900	Bring on loss of consciousness, cessation of breathing and death.
1000	Bring on immediate loss of consciousness and death.

Effects of carbon monoxide (CO) on human body

Concentration (ppm)	Effects and Toxicity
100	No noticeable effects even after breathing for a few hours.
200	A mild headache in around 1.5 hours.
400 - 500	Headache, nausea and ear ringing in around 1 hour.
600 - 1000	Loss of consciousness in around 1 - 1.5 hours.
1500 - 2000	Headache, vertigo and disabling nausea in around 0.5 - 1 hour, and losing consciousness.
3000 - 6000	Headache, vertigo, disabling nausea...etc. in a few minutes. 10 - 30 minutes exposure can lead to death.
10000	Bring on immediate loss of consciousness and death.

Applications in Gas Market

- 1. Overview of processes in gas market**
- 2. Details of individual processes**
 - 2-1: Detecting leaks from pipe joints and related facilities**
 - 2-2: Detecting and measuring odorant leaks**
 - 2-3: Facility inspections and maintenance work**
 - 2-4: Leakage inspections using boring**
 - 2-5: Gas engineering work**
 - 2-6: Interior pipe and gas equipment installation and valve opening**
 - 2-7: Gas engineering work inside large-scale customer gas facilities**

1. Overview of processes in gas market



⇒ Go to 2-3.

⇒ Go to 2-5.

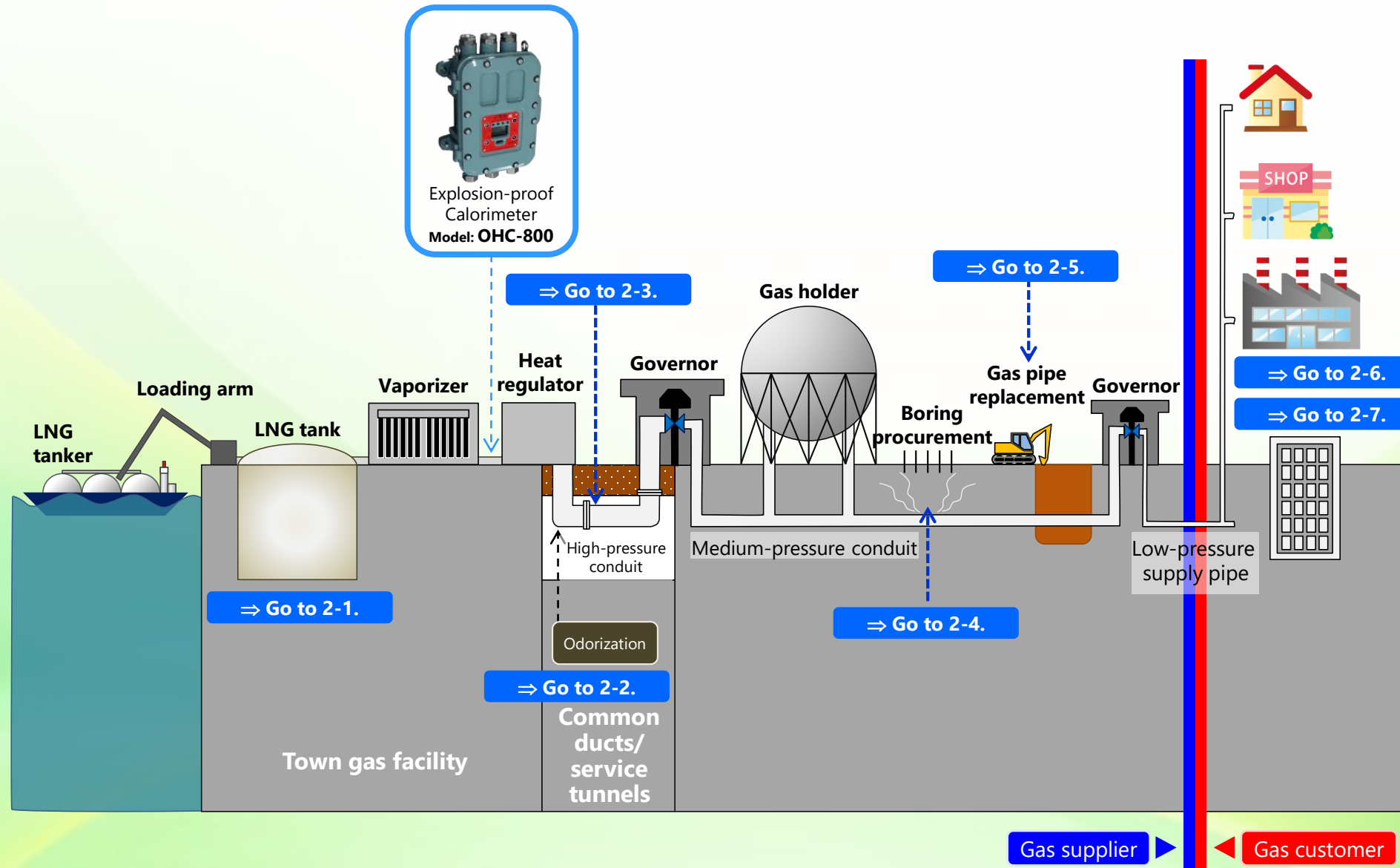
⇒ Go to 2-6.

⇒ Go to 2-7.

⇒ Go to 2-4.

⇒ Go to 2-1.

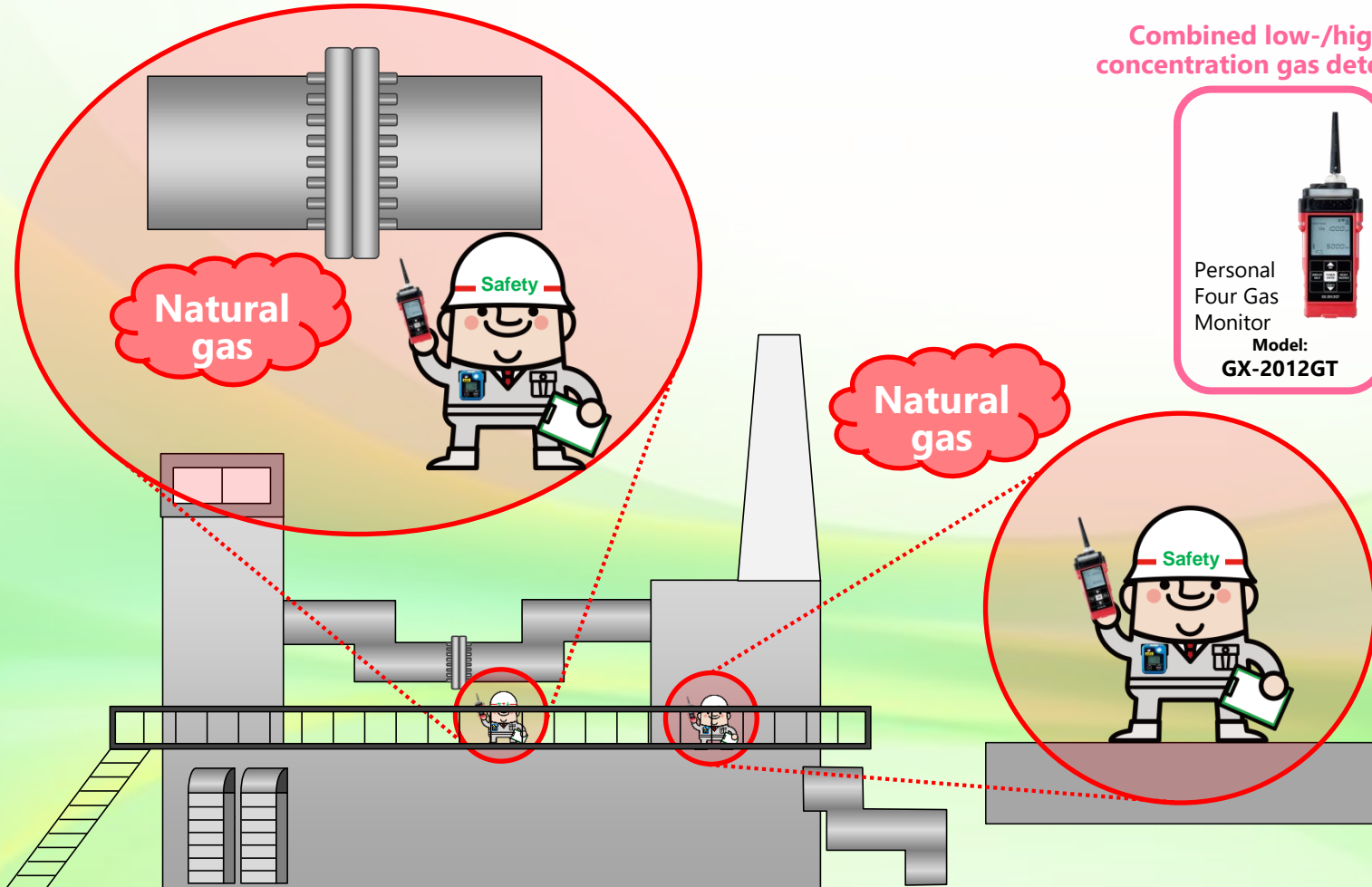
⇒ Go to 2-2.



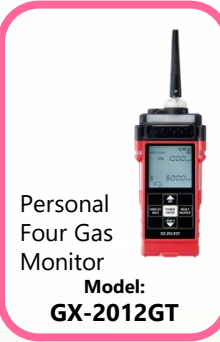
2-1: Detecting leaks from pipe joints and related facilities

Description: Town gas plants typically have vaporizer facilities that spray seawater over containers of liquefied natural gas (LNG) to heat and return the LNG to a gaseous state. Since LNG liquefies at the ultralow temperature of -162°C , it's readily vaporized by spraying seawater.

Hazardous risks: Natural gas leaking from joints within town gas plants—for example, at LNG tanks or vaporizers—poses explosion risk. ⇒ Detecting natural gas to prevent explosions



Combined low-/high-concentration gas detector Low-concentration gas detector



Combustible gas detector for workers



2-2: Detecting and measuring odorant leaks

Description: The process of liquefying natural gas into LNG removes sulfur, moisture, and dust and produces a colorless, transparent, odorless liquid. Since LNG remains odorless when it reverts to gas, an odorant is added to help detect gas leaks.

Hazardous risks: Leaks from odorant tank pose risk of poisoning.

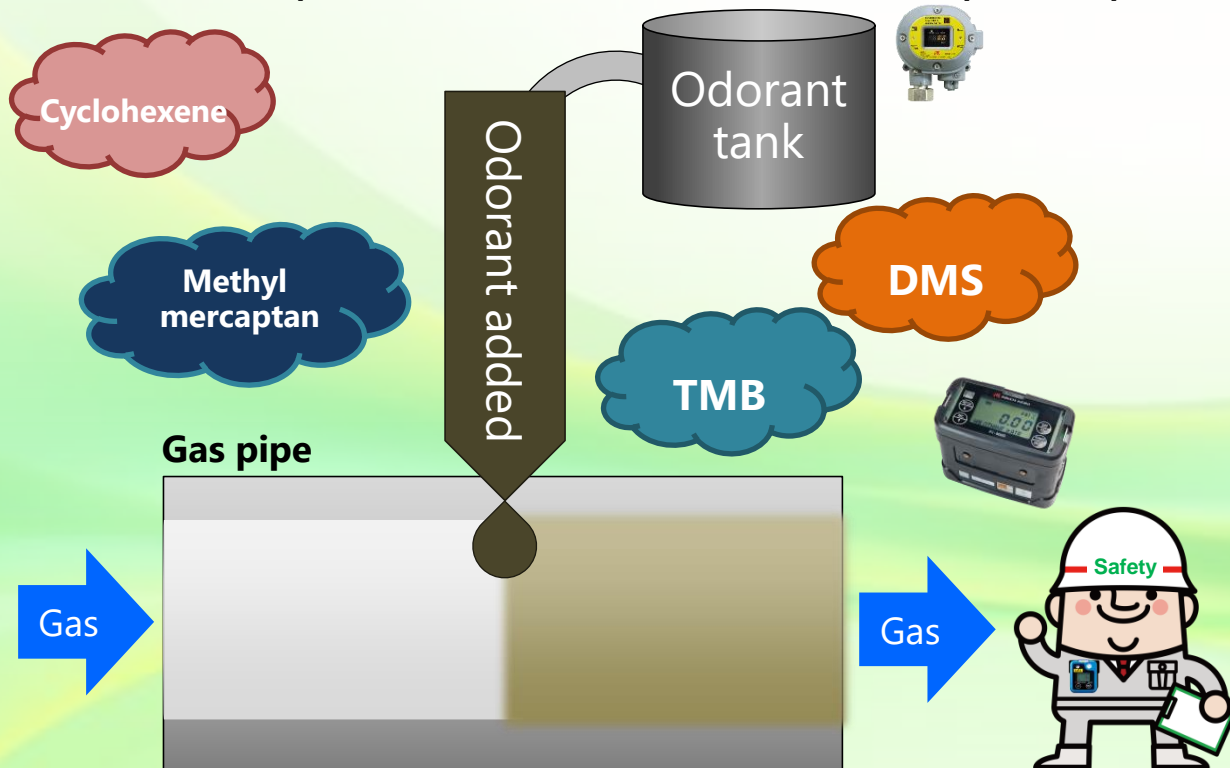
Inadequate purging of odorant facilities during maintenance may lead to excessive odorant consumption.

Natural gas leaks from gas pipes pose explosion risk.

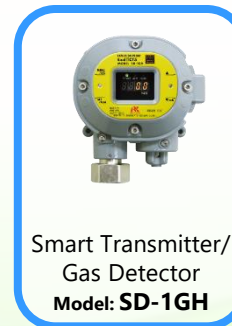
⇒ Detecting cyclohexene (C₆H₁₀), TBM (C₄H₁₀S), DMS (C₂H₆S), and methyl mercaptan (CH₃SH) in odorant to prevent poisoning

⇒ Measuring odorant constituents to make odorant use more efficient

⇒ Detecting natural gas during work to prevent explosions



Odorant leakage detector head



Odorant concentration monitor



Combustible gas detector for workers



Odorant gas detector



2-3: Facility inspections and maintenance work

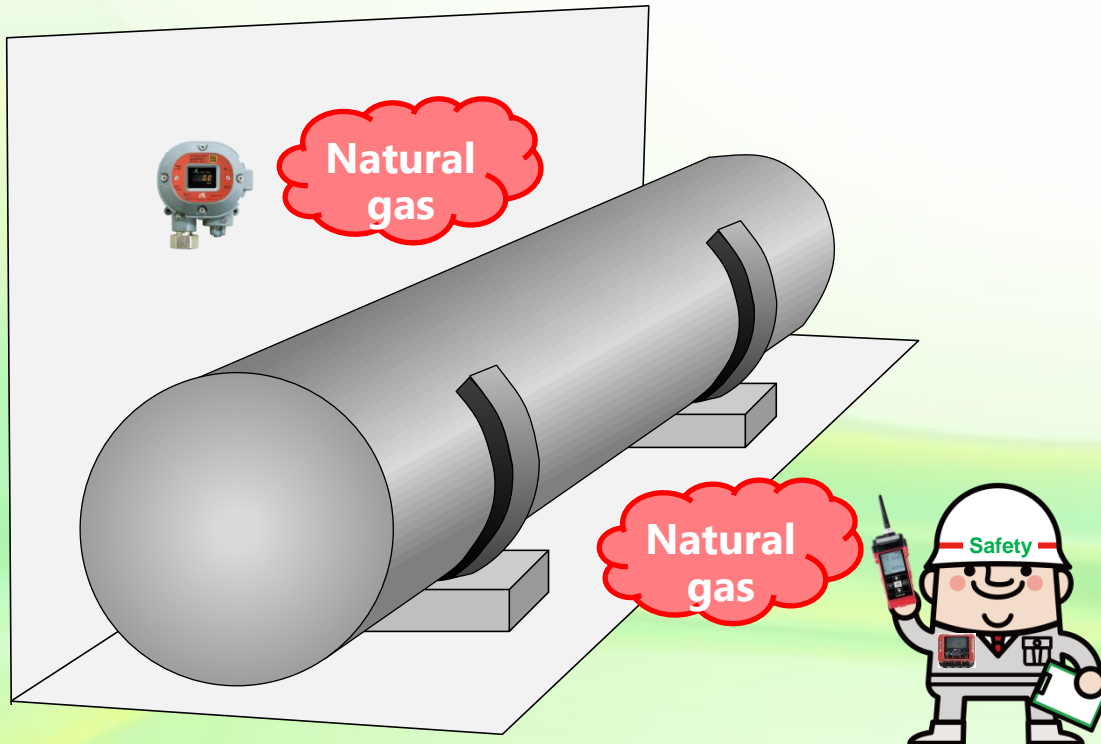
Description: The space provided around underground high-pressure conduits allows workers to perform maintenance, repairs, and inspections.

Hazardous risks: Natural gas leaks from high-pressure conduits pose explosion risk.

Insufficient ventilation within the duct may result in oxygen deficiencies.

⇒ Detecting natural gas to prevent explosions

⇒ Measuring oxygen concentrations to prevent oxygen deficiencies



Combustible gas leakage detector head



Smart Transmitter/
Gas Detector
Model: SD-1

Combined low-/
high-concentration
gas detector



Personal
Four Gas
Monitor
Model:
GX-2012GT

Combustible gas
detector for workers



Four Gas Personal
Monitor
Model: GX-2009

Low-
concentration
gas detector

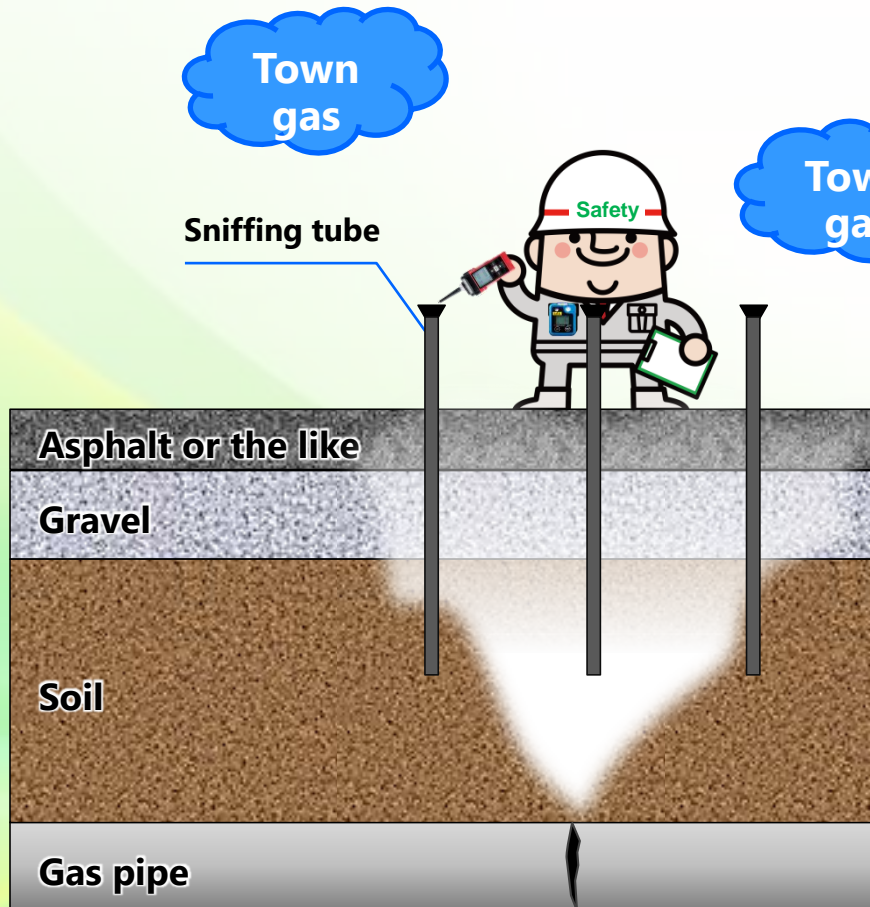


Portable
Gas Leak
Checker
Model:
SP-220 TYPE ML

2-4: Leakage inspections using boring

Description: Damage to underground gas pipes can cause town gas to diffuse into the soil above the pipes.

Hazardous risks: Diffusion of town gas into soil following damage to gas pipes poses explosion risks. ⇒ Detecting town gas to prevent explosions



Combined low-/
high-concentration
gas detector



Combustible gas
detector for
workers



Low-concentration
gas detector



High-
concentration
gas detector

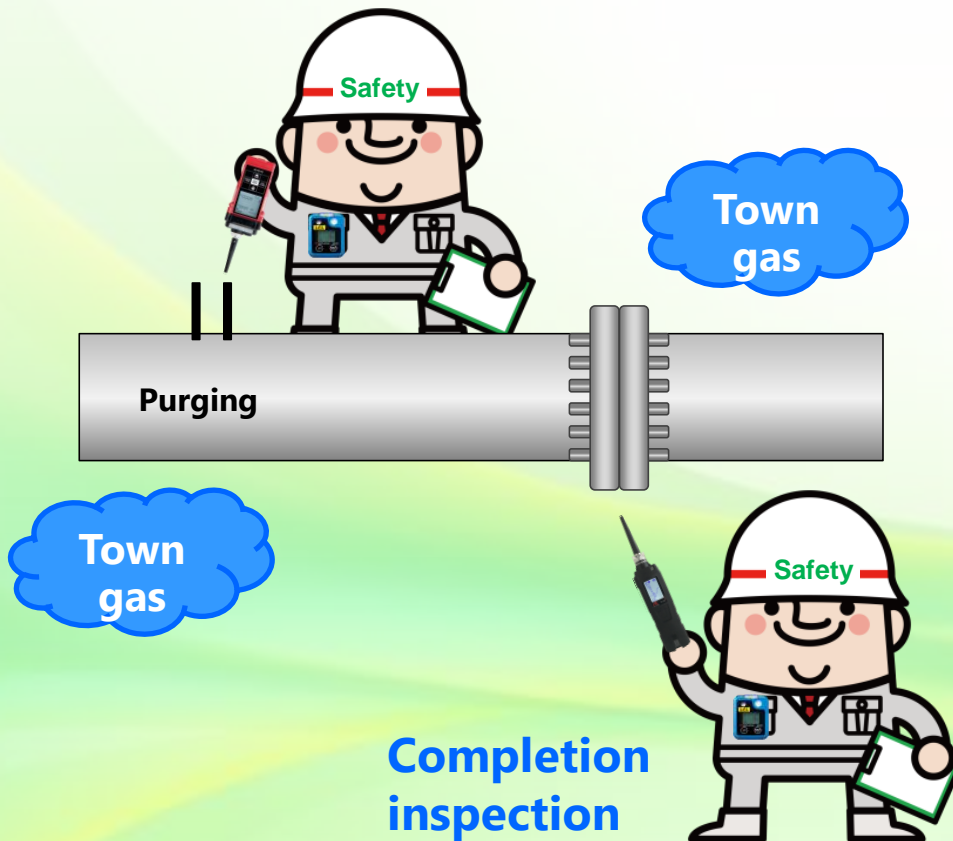


2-5: Gas engineering work

Description: Purging must be performed (i.e., gas flushed from inside the equipment) before carrying out tasks related to inspections, cleaning, or removal at gas installations.

Hazardous risks: There is a risk of explosion in the presence of an ignition source if a gas pipe is insufficiently purged and town gas is allowed to mix with air.

⇒ **Detecting town gas to prevent explosions**
Measuring combustible gas and oxygen concentrations to confirm flushing rate



Low-concentration gas detector
Combined low-/high-concentration gas detector



Combustible gas detector for workers



High-concentration gas detector

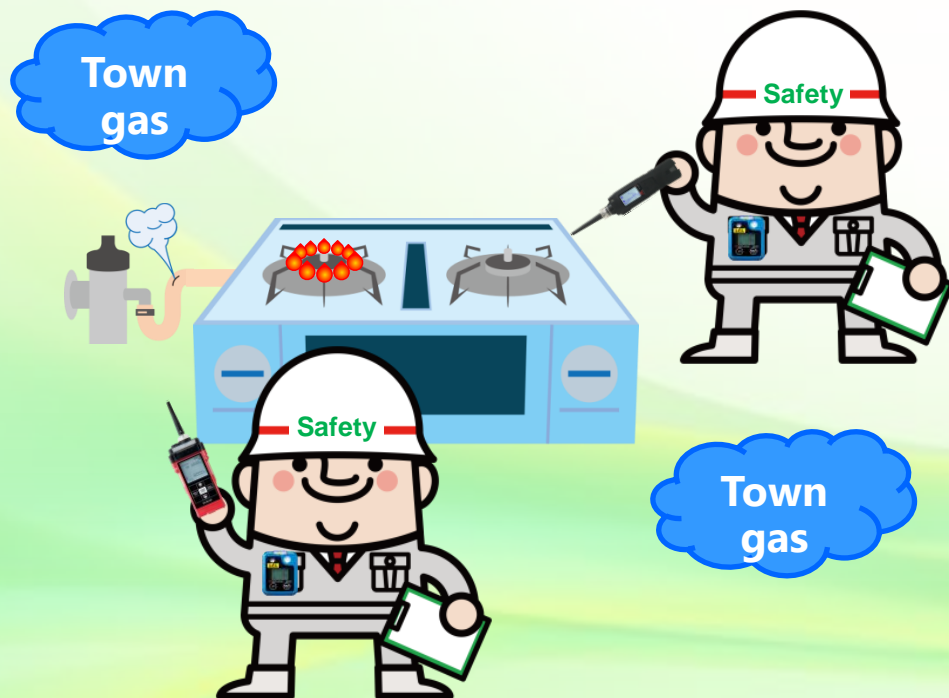


2-6: Interior pipe and gas equipment installation and valve opening

Description: Pipes and gas equipment must be installed and valves opened inside gas customers' homes, stores, and factories before gas can be used.

Hazardous risks: Gas leaks during the process of installing interior pipe and gas equipment pose explosion risks.

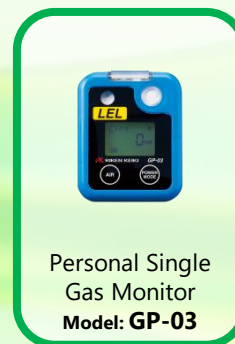
⇒ Detecting town gas leaks to prevent explosions



Low-concentration gas detector **Combined low-/high-concentration gas detector**



Combustible gas detector for workers



High-concentration gas detector

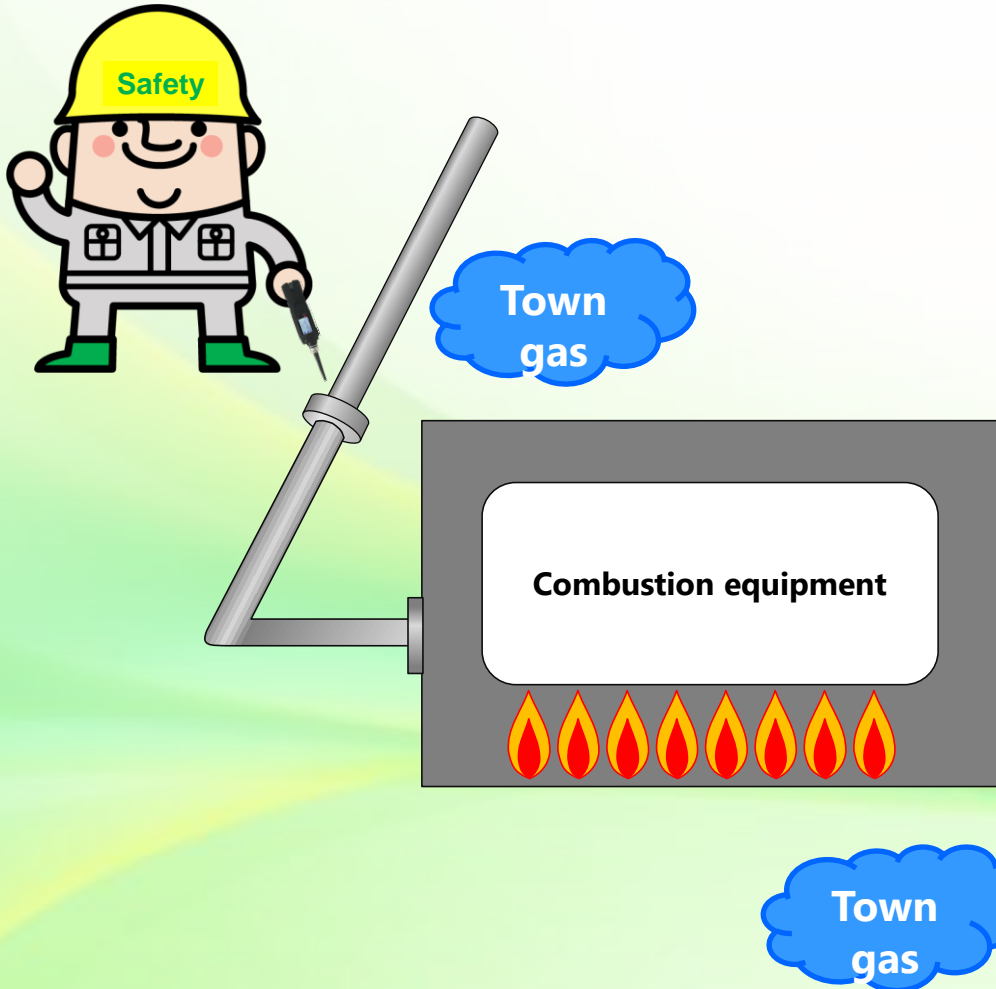


2-7: Gas engineering work inside large-scale customer gas facilities

Description: Combustion equipment installed in large-scale customer gas facilities must be adjusted periodically.

Hazardous risks: Town gas leaks from pipes occurring while workers adjust combustion equipment pose explosion risk.

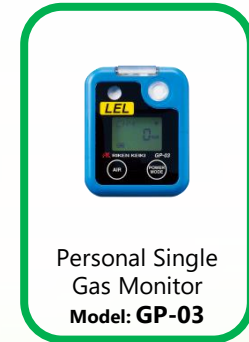
⇒ Measuring town gas to prevent explosions



Low-concentration
gas detector



Combustible gas
detector for workers





RIKEN KEIKI

Major Examples of Accidents

Prepared by extracting and processing materials from the Safety at Work Site
(Ministry of Health, Labour and Welfare: <http://anzeninfo.mhlw.go.jp/index.html>)

Case of organic solvent poisoning during unscheduled work in a metal product washing unit

[Location of accident]

This accident occurred inside an automatic ultrasonic washing unit used to wash die-cast products in a factory that manufactures solenoid valves and other components for gas equipment.

[Cause of accident]

A basket rotating in the washing tank inside the washing unit came loose and scattered the products being washed inside the tank. A worker who had entered the washing unit to pick up the scattered products inhaled dichloromethane vapor given off by cleaning fluid half left in the unit.

[Damage/injuries]

The worker, who lost consciousness after inhaling the cleaning fluid vapor, was rescued after being found caught on a hanger inside the washing unit by another cleaning worker. The worker was diagnosed with dichloromethane poisoning and was absent from work for 15 days.

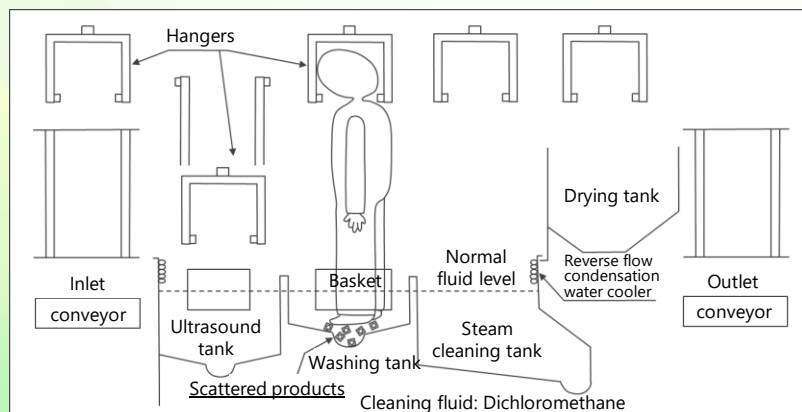


Fig. Washing unit cross-sectional diagram (at time of accident)



Wearing gas detectors on a routine basis enables early detection of toxic gas leaks and improves work safety.



RIKEN KEIKI

Product Information



RIKEN KEIKI



Explosion-proof Calorimeter

Model: OHC-800

Features

- Incorporates Riken Keiki's unique "optsonic" calculation method (Japanese Patent No. 518483). Resistant to influence from incombustible gases for high-precision measurements
- Fast response at 90% response within 5 seconds
- High repetition accuracy within ± 0.02 MJ/m³
- Hydrogen explosion-proof enclosure (Exd IIB + H₂T4) required for calorimeters allows installation in dangerous areas.
- Excellent temperature characteristics, with temperature change of 0.10 MJ/m³ or less per day
- Calorific value/specific gravity/Wobbe index switchable with key operation, eliminating troublesome calculations



RIKEN KEIKI



GX-2012GT



GX-2012

Personal Four
Gas Monitors

Model:

GX-2012 series

Features

- A single unit allows detection of methane gas and indicates readings in three units (ppm, %LEL, vol%). (GX-2012GT/vol% range)
- This is the first detector made in Japan with a 1 ppm hydrogen sulfide alarm setpoint. (ACGIH TWA 1 ppm supported)
- Intrinsically safe explosion-proof enclosure (explosion proof Group II C rating) allows use even in hydrogen and acetylene atmospheres.
- Protection rating equivalent to IP 67 ensures safe use for outdoor work.
- Three-direction alarm lamps and two-direction alarm buzzers to alert both the carrier and those in surrounding areas
- Buzzer volume of 95 dB or more can be clearly heard even in noisy factory environments.
- Can be used with either a dry-cell battery unit or a lithium-ion battery unit (available separately).



RIKEN KEIKI

Portable
Multi Gas Detector

Model:
GX-6000



Features

- A single unit can simultaneously display up to six types of gases, including VOCs. This product is the first of its kind from a Japanese manufacturer.
- The PID sensor enables measurements of more than 200 types of target chemical substances.
- Ideal for checking the risks and hazards of chemical substances as required under the Industrial Safety and Health Act
- Support for multilingual display (Japanese, English, French, Spanish, etc.)
- Equipped with convenient new functions, including panic alarm and LED flashlight



RIKEN KEIKI



GP-03

(For combustible gases)

OX-03

(For oxygen)

HS-03

(For hydrogen sulfide)

CO-03

(For carbon monoxide)

Personal
Single Gas Monitors

Model: 03 series

Features

- Models powered by rechargeable batteries have been added to the product line.
- Standard protective cover protects the main unit from scratches, dirt, and impact.
- Compact, lightweight design doesn't interfere with work.
- Inherently safe and explosion-proof enclosure is ideal for use in hazardous locations.



RIKEN KEIKI



Features

- A single unit can measure up to eight different gas types.
- Choice of two suction methods
Automatic suction using the built-in pump/manual suction using the hand aspirator
- Includes intermittent measurement mode (with automatic suction only)
Concentrations and times are recorded to allow monitoring of gas concentration trends via the main unit's readout.
- Easy-to-read LCD display
Clearly displays target gas type, gas concentration, measurement units, and remaining battery levels.

Optical
Gas Indicator

Model: FI-8000



RIKEN KEIKI



Four Gas
Personal Monitor

Model: GX-2009

Features

- Explosion-proof product that can be used in hydrogen/acetylene atmospheres.
- Protection rating equivalent to IP 67 ensures safe use for outdoor work.
- Three-direction alarm lamps and two-direction alarm buzzers to alert both the carrier and those in surrounding areas
- Buzzer volume of 95 dB or more can be clearly heard even in noisy factory environments.
- Simultaneous display of gas concentrations of up to four components on large LCD screen
- Also equipped with clock display and data logger functions
- Connecting the optional RP-2009 dedicated GX-2009 pump suction unit allows use as a suction type detector.



RIKEN KEIKI



SD-1

SD-1RI

(For combustible
gases)



SD-1GH

(For combustible/
toxic gases)



SD-1EC

(For carbon monoxide/
hydrogen sulfide)



SD-1OX

(For oxygen)

Smart Transmitter/
Gas Detectors

Model: SD-1 series

Features

- Explosion-proof products that can be used in hydrogen/acetylene atmospheres
- Waterproof/dustproof enclosure (IP 65 equivalent) allows deployment in severe environments.
- Supports HART Communication Protocol, allowing transmission of more information over legacy analog 4-20 mA connections.
 - * Excluding SD-1 (TYPE NC)
- SD-1RI, SD-1EC, and SD-1OX are SIL 2 certified in all parts of the functional safety standard, marking a first for Japanese manufacturers.
- Using the suction cap for the SD-1 series and connecting the detector to a suction pump or an aspirator unit enables suction type operation.



RIKEN KEIKI



Portable
Gas Leak Checker

Model: SP-220
TYPE ML

Features

- Quickly and reliably detects low concentrations of town gas and LPG gas leaks.
- Tough, compact, lightweight exterior
- Incorporates internal filter for improved sensor durability.
- Incorporates data logger function capable of recording up to 256 entries for date, time, and measured gas concentrations.
- LED lighting allows accurate measurement even in dark locations.



RIKEN KEIKI



Portable
Gas Detector

Model:
NP-1000

Features

- Capable of measuring gases contained in N₂ or CO₂ gas in units of vol%
- The base gas can be selected from air, N₂, and CO₂.
- A single unit can detect five different gas types (methane, propane, isobutane, argon, and helium) using the gas type switching function.
- Includes pump booster feature to provide suction force even over long distances. (Suction flow rate: 0.3 L/min ⇒ 0.6 L/min)
- A cartridge-type filter (available separately) can be attached to the standard probe. (Example filter types: for hydrogen sulfide removal, for silicon removal)



International Agents

International Agents



North America

South America

Asia and Pacific

Russia and Central Asia

Europe

Middle East

Africa

International agents (table of contents)

North America

U.S.A.

South America

Brazil

Argentina

Peru

Chile

Uruguay

Asia and Pacific

China

South Korea

Taiwan

Singapore

Malaysia

Indonesia

Thailand

India

Vietnam

Philippines

Australia

Europe

Germany

Greece

THE NETHERLANDS

Norway

Turkey

U.K.

Middle East

U.A.E.

Israel

Africa

South Africa

Russia and Central Asia

Russia

International agents (U.S.A.)

RKI INSTRUMENTS, INC.

ADDRESS : 33248 CENTRAL AVENUE, UNION CITY, CA94587-2010 U.S.A.

TEL : +1-510-441-5656

FAX : +1-510-441-5650

E-MAIL : bob@rkiinstruments.com, sandra@rkiinstruments.com

PERSON : MR. BOB PELLISSIER (PRESIDENT)
MRS. SANDRA GALLAGHER (VICE PRESIDENT)

WEBSITE : <http://www.rkiinstruments.com/>

International agents (BRAZIL)

HIDEO NAKAYAMA IMP. EXP. COM. E INDUSTRIA LTDA

ADDRESS : RUA SANTA AMÉLIA, 33 PRACA DA BANDEIRA
RIO DE JANEIRO RJ CEP: 20.260-030 BRAZIL

TEL : +55-21-2590-3496

FAX : +55-21-2270-6390

E-MAIL : hideko@nakayama.com.br

PERSON : MR. HIDEO NAKAYAMA (PRESIDENT)
MS. HIDEKO NAKAYAMA

WEBSITE : <http://www.nakayama.com.br/>



International agents (ARGENTINA)

Prevent Gas SA

ADDRESS : INCLAN 4185 (C1258ABK) CIUDAD DE BUENOS AIRES, ARGENTINA
TEL : +54-11-4925-6342
FAX : +54-11-4925-6342
E-MAIL : ventas@preventgas.com.ar
PERSON : Mr. German Rosas
WEBSITE : <http://preventgas.com.ar/>

HUBERG SUDAMÉRICA S.A.

ADDRESS : ERASMO (CALLE 79) 1047 (B1650HOE) VILLA PIAGGIO
SAN MARTÍN, BUENOS AIRES, ARGENTINA
TEL : +54-11-4713-6068
FAX : +54-11-4713-6072
E-MAIL : arguello.juan@huberg.com
PERSON : MR. JUAN IGNACIO ARGUELLO
WEBSITE : <http://www.huberg.com.ar>



International agents (PERU)

RESET ELECTRONICA Y SISTEMAS S.R.L.

ADDRESS : Calle Martin de Murua 150 Of. 1004 - 1005
Edificio Plexus San Miguel Business Center
San Miguel - Lima 32, PERU

TEL : +51-1-6367303

FAX :

E-MAIL : enquiries@resetnaval.com

PERSON : Mr. Max Muñoz Moran

WEBSITE : <http://www.resetnaval.com/>

International agents (CHILE)

Electronic Marine Ltd

ADDRESS : Uruguay 556 of 404 Valparaiso, CHILE
TEL : 56-32-2220050
FAX : 56-32-2593135
E-MAIL : marketing@electronicmarine.cl
PERSON : Alejandra Palominos (Marketing Manager)
WEBSITE : <http://www.electronicmarine.cl>

International agents (URUGUAY)

microsur

ADDRESS : Carlos María Morales 934, 11200 Montevideo, Uruguay

TEL : 598-2410-1128

FAX : 598-2410-1128

E-MAIL : microsur@microsur.org

PERSON : Dra.Nermys Hernandez

WEBSITE : <http://www.microsur.org>

International agents (CHINA)

RIKEN KEIKI COMMERCIAL(SHANGHAI) CO., LTD.

ADDRESS : HEAD OFFICE : ROOM4A SHANGHAI WATANABE INTERNATIONAL
COMMERCIAL BUILDING NO.55, LINPING N.ROAD, HONGKOU DISTRICT,
SHANGHAI, 200086 CHINA
SALES DEPARTMENT OFFICE : ROOM1106 DALIAN LEE WAN HOTEL NO.8,
MINZHU SQUARE, ZHONGSHAN DISTRICT, DALIAN, LIAONING, 116001
CHINA

TEL : 86-411-8212-3832
FAX : 86-411-8212-3833

E-MAIL : dl@rkkc.net (Ms. Sun Jun)
dl101@rkkc.net (Ms. Qu shuai)
dl102@rkkc.net (Ms. Xu fei)

WEBSITE : <http://www.rikenkeiki.asia>

International agents (KOREA)

RIKEN KEIKI KOREA CO., LTD.

ADDRESS : 23, HWAJEONSANDAN 2-RO 134,
GANGSEO-GU, BUSAN, 46741 KOREA
TEL : 82-51-712-9900 FAX: 82-51-518-7736
E-MAIL : master@rikenkeiki.co.kr PERSON: MR.SUN-GU,LEE
WEBSITE :
(KOREAN) <http://rikenkeiki.co.kr/bn/>
(ENGLISH) <http://rikenkeiki.co.kr/bn/english/>

HIGH INTEGRATED TECHNOLOGY, INC.

ADDRESS : 72, SEGYOSANDAN-RO, PYEONGTAEK-SI,
GYEONGGI-DO, 17843, KOREA
TEL : 82-31-650-7000 FAX: 82-31-650-7007
E-MAIL : info@hitinc.co.kr PERSON: MR.HYUNG-SIL, KIM
WEBSITE :
(KOREAN) <http://www.hitinc.co.kr/>
(ENGLISH) http://www.hitinc.co.kr/?strMode=company_e/company



International agents (TAIWAN)

RIKEN KEIKI TAIWAN CO., LTD. HEAD OFFICE

ADDRESS : NO.87, YANGMING RD., SHANHUA JEN, TAINAN, 741, TAIWAN
TEL : 886-6-581-1224
FAX : 886-6-581-1250
E-MAIL : episys@ms22.hinet.net
PERSON : MR. SEITARO TAKAHASHI (PRESIDENT)
WEBSITE : <http://www.rikenkeiki.com.tw/admin/news/front/news.php>

RIKEN KEIKI TAIWAN CO., LTD. TAICHUNG BRANCH

ADDRESS : NO.2, ALY.14, LN.150-30, SEC.3, XITUN RD., XITUN DIST., TAICHUNG CITY 407,
TAIWAN
TEL : 886-4-2462-5386
FAX : 886-4-2462-5508
E-MAIL : johnny@rikenkeiki.com.tw
PERSON : MR. WU WEN CHENG

International agents (SINGAPORE)

R K INSTRUMENTS (S) PTE LTD

ADDRESS : 102F PASIR PANJANG ROAD #03-11, CITILINK WAREHOUSE COMPLEX
SINGAPORE 118530

TEL : 65-6275-3398

FAX : 65-6275-3387

E-MAIL : rk@rkinstruments.com.sg

PERSON : MR. BERNARD QUEK (PRESIDENT)

WEBSITE : <http://www.rkinstruments.com.sg/>



International agents (MALAYSIA)

KINETICS SYSTEMS MALAYSIA SDN. BHD.

ADDRESS : 12A, JALAN RINGGIT 23/11 , SECTION 23, 40300 SHAH ALAM, SELANGOR
DARUL EHSAN MALAYSIA

TEL : 603-5542-2288

FAX : 603-5542-2289

E-MAIL : ck.chooi@kinetics.net

PERSON : MR. CHOOI CHOON KEET
(GENERAL MANAGER)

WEBSITE : <http://www.kinetics.net/>



International agents (INDONESIA)

PT. PRATAMA GRAHA SEMESTA

ADDRESS : KOMPLEKS LODAN CENTER BLOK H-11 JL. LODAN RAYA NO.2 ANCOL - PADEMANGAN
JAKARTA UTARA 14430 INDONESIA

TEL : 62-21-6900656

FAX : 62-21-6900657

E-MAIL : sales@ptpgs.co.id

PERSON : MR. FRENGKY TOMBOKAN



PT. CENTRADINDO UNITRAS (FOR PERTAMINA & MARINE SECTOR)

ADDRESS : COMPLEX PERKANTORAN DUTA HARAPAN INDAH JL. KAPUK MUARA RAYA BLOK SS
NO.3 JAKARTA UTARA 14460 INDONESIA

TEL : 62-21-6624347

FAX : 62-21-6623594

E-MAIL : centradindo.unitras@gmail.com

PERSON : MR. DJOHAN DAHLIAN (MANAGING DIRECTOR)

International agents (THAILAND)

TAIYO GASES CO., LTD.

ADDRESS : 17TH FLOOR SERM-MIT TOWER, 159 SUKHUMVIT 21 ROAD, NORTH
KLONGTOEY, WATTANA, BANGKOK 10110 THAILAND

TEL : 66-2-260-2691

FAX : 66-2-260-2690

E-MAIL : hato@taiyogases.th.com

PERSON : MR. KAZUNARI HATO

WEBSITE : <http://www.taiyogases.th.com/>

International agents (INDIA)

TRITECH

ADDRESS : 121,VEENA INDUSTRIAL ESTATE, OPP.FITWELL HOUSE, L.B.S.MARG,
VIKHROLI(W) MUMBAI-400 083 INDIA

TEL : 91-22-2577-7288, 6796-9990

FAX : 91-22-6796-9991

E-MAIL : tritec@vsnl.com

PERSON : MR. NARESH SHARMA MR. JIGNESH SHAH

WEBSITE : <http://www.tritech.in/>



International agents (VIETNAM)

VIETNAM GAS DETECTOR ONE MEMBER CO., LTD.

ADDRESS : 79 Ly Chinh Thang St, ward 8, Dist 3, HCMC, Vietnam

TEL : +84-(0)28-35262986 / 35262987

FAX : +84-(0)28-35262980

E-MAIL : info@vina-gasdetector.vn

PERSON : MR. CAO MINH LOI (Director)

WEBSITE : <http://vina-gasdetector.vn/>



International agents (PHILIPPINES)

PILIPINAS TRADE GAS, INC. (PTGI)

ADDRESS : 23RD FLOOR ONE CORPORATE CENTER DONA JULIA VARGAS AVE.,
CORNER MERALCO AVENUE, ORTIGAS CENTER PASING CITY,
PHILIPPINES

TEL : 632-635-7320

FAX : 632-635-7322

E-MAIL : gerry.gueco@yahoo.com.ph

PERSON : MR. S. HARA (PRESIDENT)
MR. GERRY C. GUECO (IN CHARGE)



International agents (AUSTRALIA)

CONTROL EQUIPMENT PTY. LTD.

ADDRESS : UNIT 1/3 DEAKIN STREET, BRENDALE QLD 4500, AUSTRALIA

TEL : 61-7-3481-9000

FAX : 61-7-3481-9088

E-MAIL : sales@controlequipment.com.au

PERSON : MR. GREG LOVE (GENERAL MANAGER)

WEBSITE : <http://www.controlequipment.com.au/>



International agents (GERMANY)

RIKEN KEIKI GmbH

ADDRESS : Theodor-Heuss-Allee 112, 60486 Frankfurt am Main, Germany

TEL : +49-6966-7741-460, 461

E-MAIL : s-ono@rikenkeikigmbh.de

PERSON : MR. SHINTARO ONO(Managing Director)

WEBSITE : <http://www.rikenkeiki.com/de/>



International agents (GREECE)

ZERVOUDAKIS MARINE SUPPLIES LTD.

ADDRESS : 31, MILOU STREET, PIRAEUS 18545, GREECE

TEL : +30-210-4623700

FAX : +30-210-4627900

E-MAIL : zerv@otenet.gr

PERSON : MR. JOHN ZERVOUDAKIS

WEBSITE : <http://www.zervoudakis.gr/>



International agents (THE NETHERLANDS)

GMS Instruments B.V.

ADDRESS : Driemanssteeweg 190, 3084 CB, Rotterdam, The Netherlands

TEL : +31102938860

E-MAIL : sales@gms-instruments.nl

PERSON : MR. SEBASTIAN KELDERMAN AND MR. MARKUS FRANK

WEBSITE : <http://gms-instruments.nl/>

International agents (NORWAY)

MARTIN BRUUSGAARD & CO. AS.

ADDRESS : LOKKETANGEN 20A, 1337 SANDVIKA NORWAY
P.O. BOX 3, 1301 SANDVIKA NORWAY

TEL : +47-6754-9330

FAX : +47-6754-9331

E-MAIL : dag@bruusgaard.no

PERSON : MR. DAG MAARTMANN

WEBSITE : <http://www.bruusgaard.no/>



International agents (TURKEY)

DOGANAK COLL. CO.

ADDRESS : KARAKOY, OKCUMUSA CADDESİ, IPEK ÇIKMAZI,
BOGAZICI HAN NO:6 KAT:2
34420 ISTANBUL, TURKEY

TEL : +90-212-244-5318 / 245-2512

FAX : +90-212-243-5704

E-MAIL : doganak@doganak.com

PERSON : MR. MEHMET ALI AKYUZ

WEBSITE : <http://www.doganak.com/>



International agents (U.K.)

WEATHERALL EQUIPMENT & INSTRUMENTS LTD.

ADDRESS : UNIT 1 STATION APPROACH, WENDOVER AYLESBURY,
BUCKS HP22 6BN ENGLAND

TEL : +44 1296 622180

FAX : +44 1296 624955

E-MAIL : sales@weatherall-uk.com

PERSON : MR. R.H.C. WORTHINGTON

WEBSITE : <http://weatherall-uk.com/>



International agents (U.A.E.)

METRO MAC

ADDRESS : WS 104, DUBAI MARITIME CITY (DMC), DUBAI, U.A.E.
P.O.BOX: 13485 DUBAI U.A.E.

TEL : +971-4-5636100

FAX : +971-4-5519973

E-MAIL : sales@metromac.com

PERSON : MR. K.K. KUTTY
(MANAGING DIRECTOR)

WEBSITE : <http://www.metromac.com/>



International agents (ISRAEL)

MODCON SYSTEMS LTD.

ADDRESS : MODCON HOUSE M. BORNSHTEIN ST.,
SOUTH AKKO INDUSTRIAL PARK, 24222 ISRAEL

TEL : +972-4-9553955

FAX : +972-4-9553956

E-MAIL : gregorys@modcon.co.il

PERSON : MR. GREGORY SHAHNOVSKY

WEBSITE : <http://www.modcon-systems.com/>



International agents (SOUTH AFRICA)

I.S.L. ENTERPRISES (PTY) LTD.

ADDRESS : 29 KLOSSER STREET PAROW 7500 SOUTH AFRICA
P.O.BOX 72 PAROW 7499 SOUTH AFRICA

TEL : +27-21-930-2354

FAX : +27-21-930-2043

E-MAIL : istvanisl@xsinet.co.za

PERSON : MR. I.S. LADANYI



International agents (RUSSIA) **TAIRIKU TRADING CO., LTD.**

ADDRESS : Head office in Tokyo, Japan KAJITANI DAIICHI BUILDING, 21-10,
SHINKAWA 2-CHOME, CHUO-KU, TOKYO 104-0033, JAPAN

TEL : +81-3-6222-0194 FAX: +81-3-6222-0201

E-MAIL : tairiku@tairiku-trading.co.jp

PERSON : MR. MORITA

WEBSITE : <http://www.tairiku-trading.co.jp/?lang=en>

OOO"TAIRIKU MOSCOW LTD."

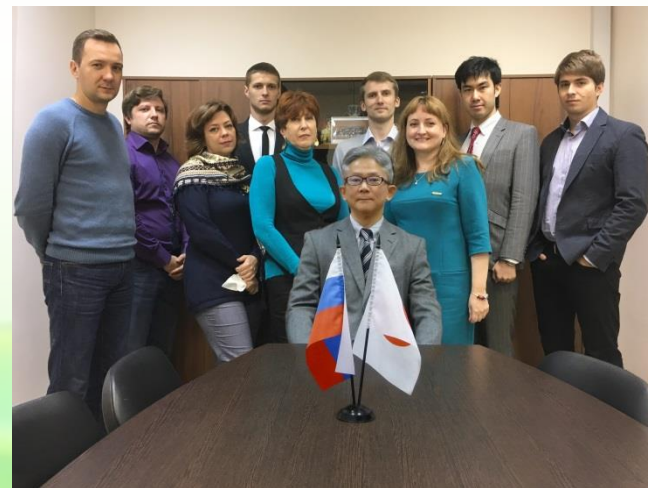
ADDRESS : RUSSIAN FEDERATION, 119049,
MOSCOW, KOROVY VAL STREET,7,
BUILDING 1, FLOOR 2,OFFICE 12

TEL : +7-495-237-18-82 +7-495-237-19-26

FAX : +7-495-931-99-47

E-MAIL : tairiku.alpeev@co.ru, ofistrk@online.ru

PERSON : MR. ALPEEV M.A., (MANAGER)





*We are a **pioneer** in creating **safe working** environments for workers.*