

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

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- **Why do we need gas detectors?**  
**Risks associated with toxic gases**
- **Applications in steel market**
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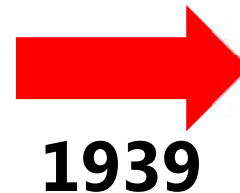


# About Riken Keiki

# About Riken Keiki



**RIKEN**



**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



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

## **Certification**

National heritage of  
analytical and scientific  
instruments  
2014

**Methane gas measurements  
in coal mine**

# 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)



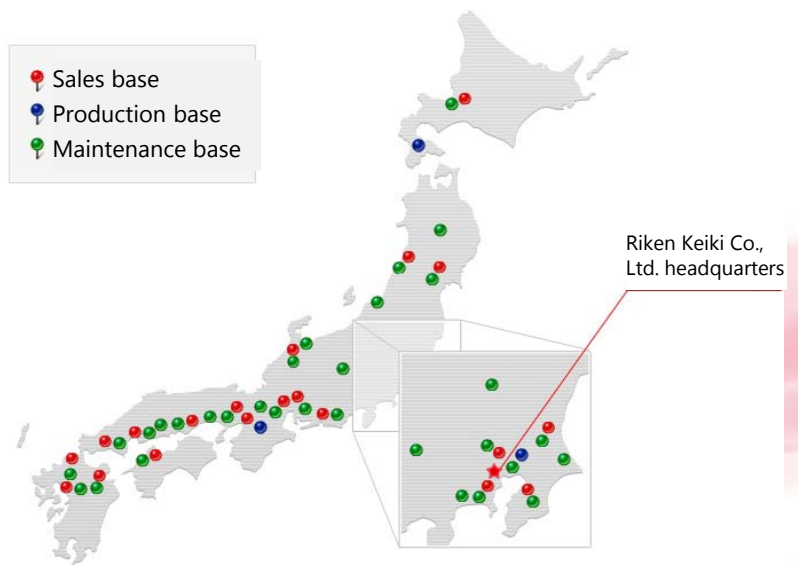
To be completed in September 2018  
(conceptual drawing)

## 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



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

# **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

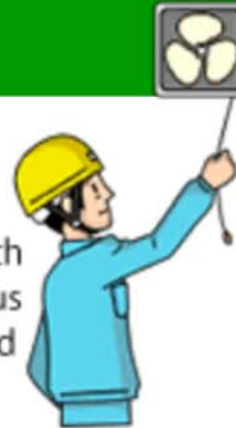
O2 Concentration  
**21%**

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 (H<sub>2</sub>S) 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 Steel Market**

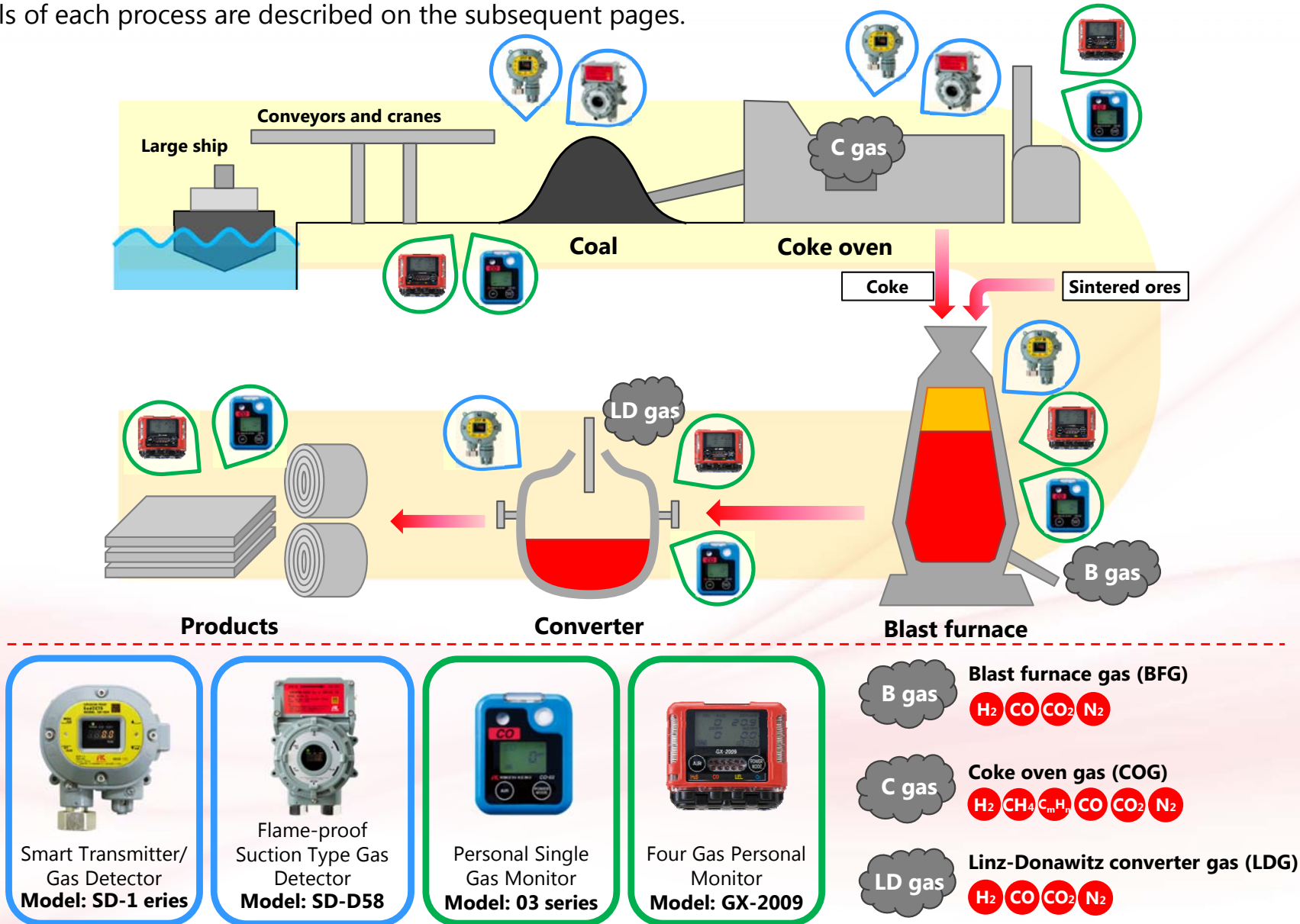


- 1. Entire flow of processes in steel market**
- 2. Details of each process (from carrying-in of raw materials to steelmaking)**
  - **2-1. Bringing in raw materials and processing**
  - **2-2. Pig iron making**
  - **2-3. Steelmaking**
- 3. By-product gases in steelworks**
- 4. Steel rolling process**

# 1. Entire flow of processes in steel market

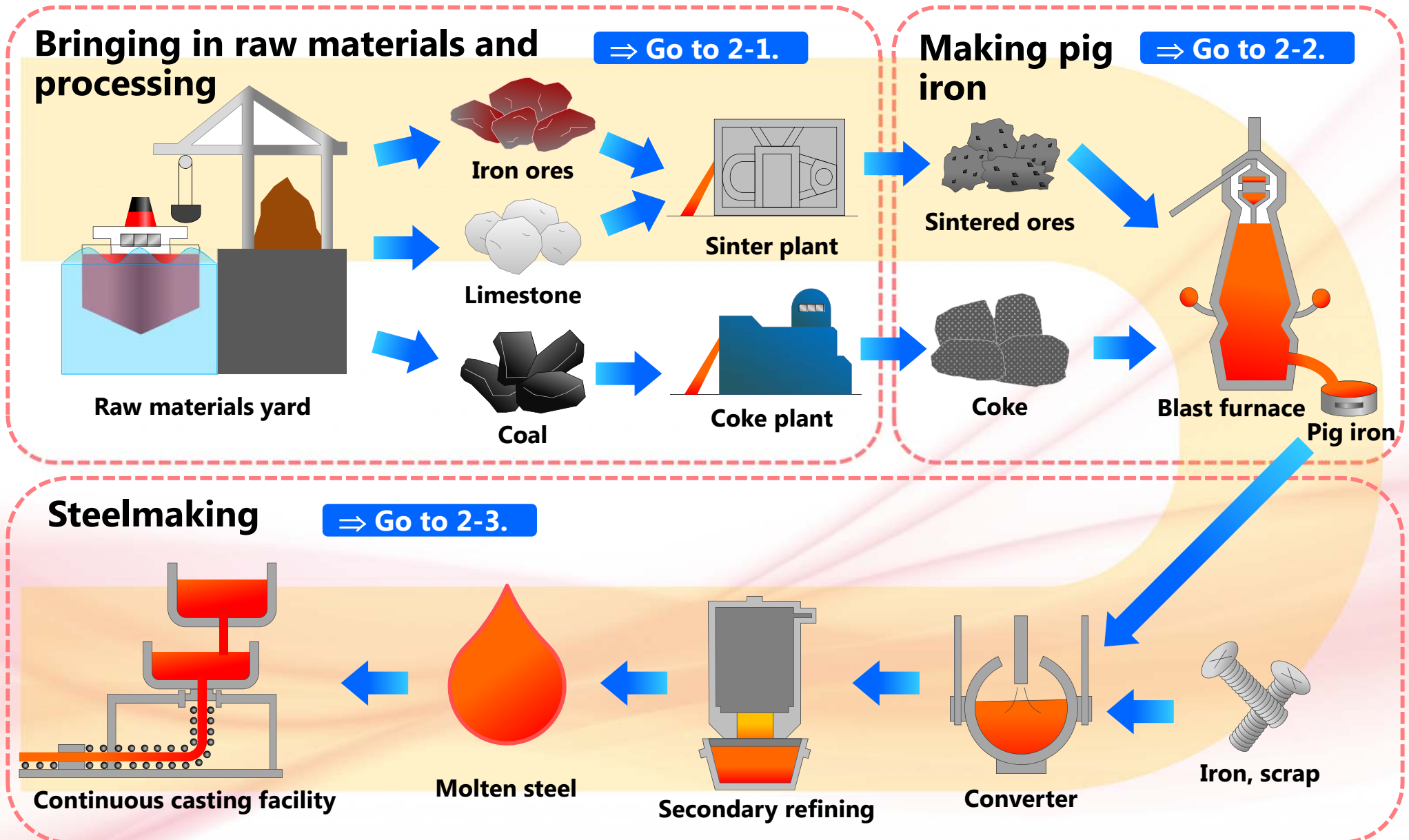
The figure below shows the risks posed by B gas, C gas, and LD gas leaks in steelmaking processes and gives examples of disaster prevention and security equipment installations.

The details of each process are described on the subsequent pages.



## 2. Details of each process (from carrying-in of raw materials to steelmaking)

This page shows the details of each process from the time raw materials are brought in through steelmaking. The subsequent pages show applications relevant to each process.

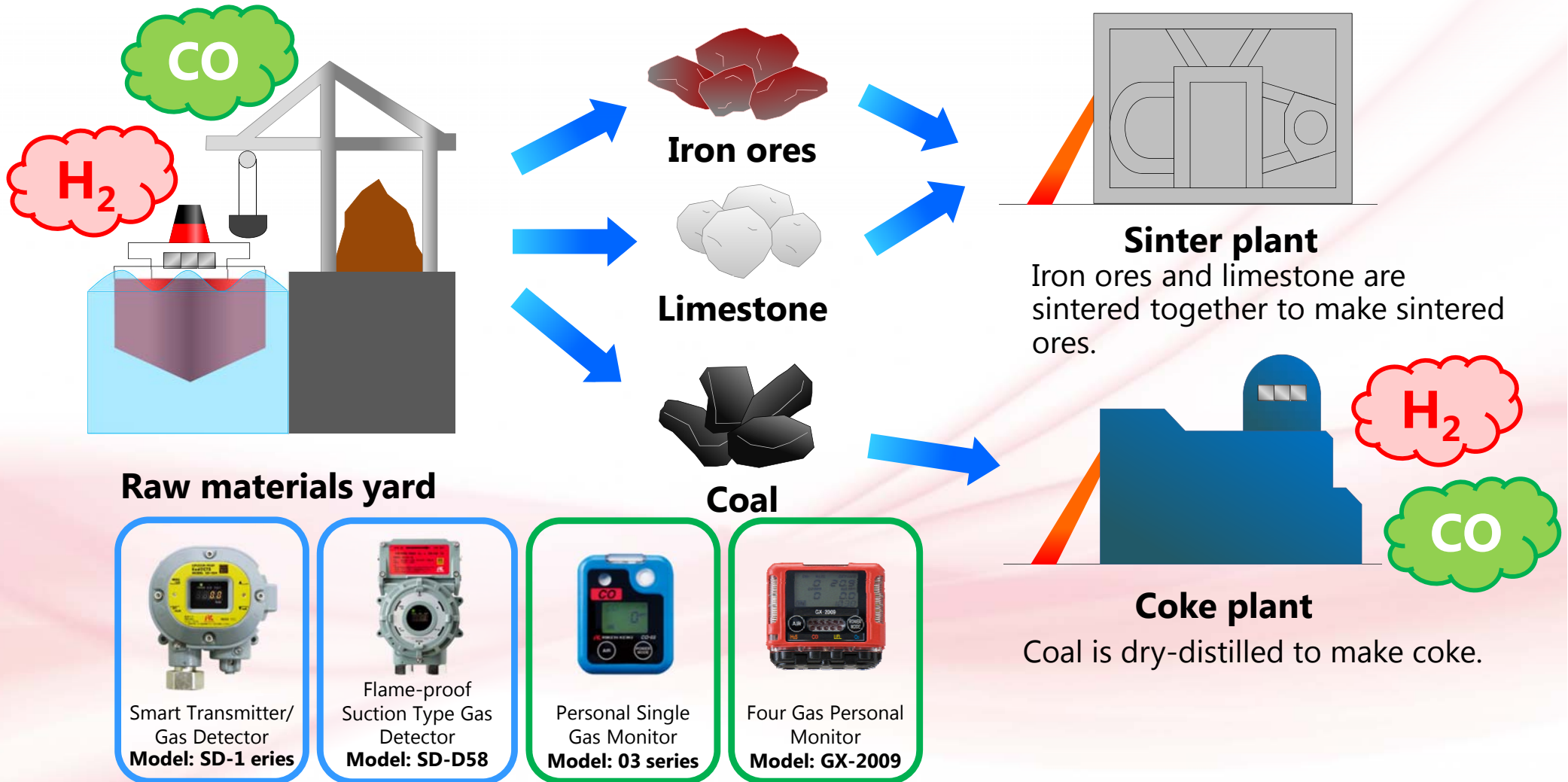


# 2-1. Bringing in raw materials and processing

**Description:** Iron ores and coal (coke), the main raw materials of iron, are transported and delivered on large ships. As pretreatment for making pig iron, iron ores must be sintered with limestone to make sintered ores, or coal must be dry-distilled at high temperatures to make coke.

**Hazardous risks:** Significant volumes of hydrogen (H<sub>2</sub>) and carbon monoxide (CO) generated in raw materials yards and coke plants can cause explosions or poisoning.

⇒ Detecting flammable gases, detecting CO to prevent poisoning, and early flame detection

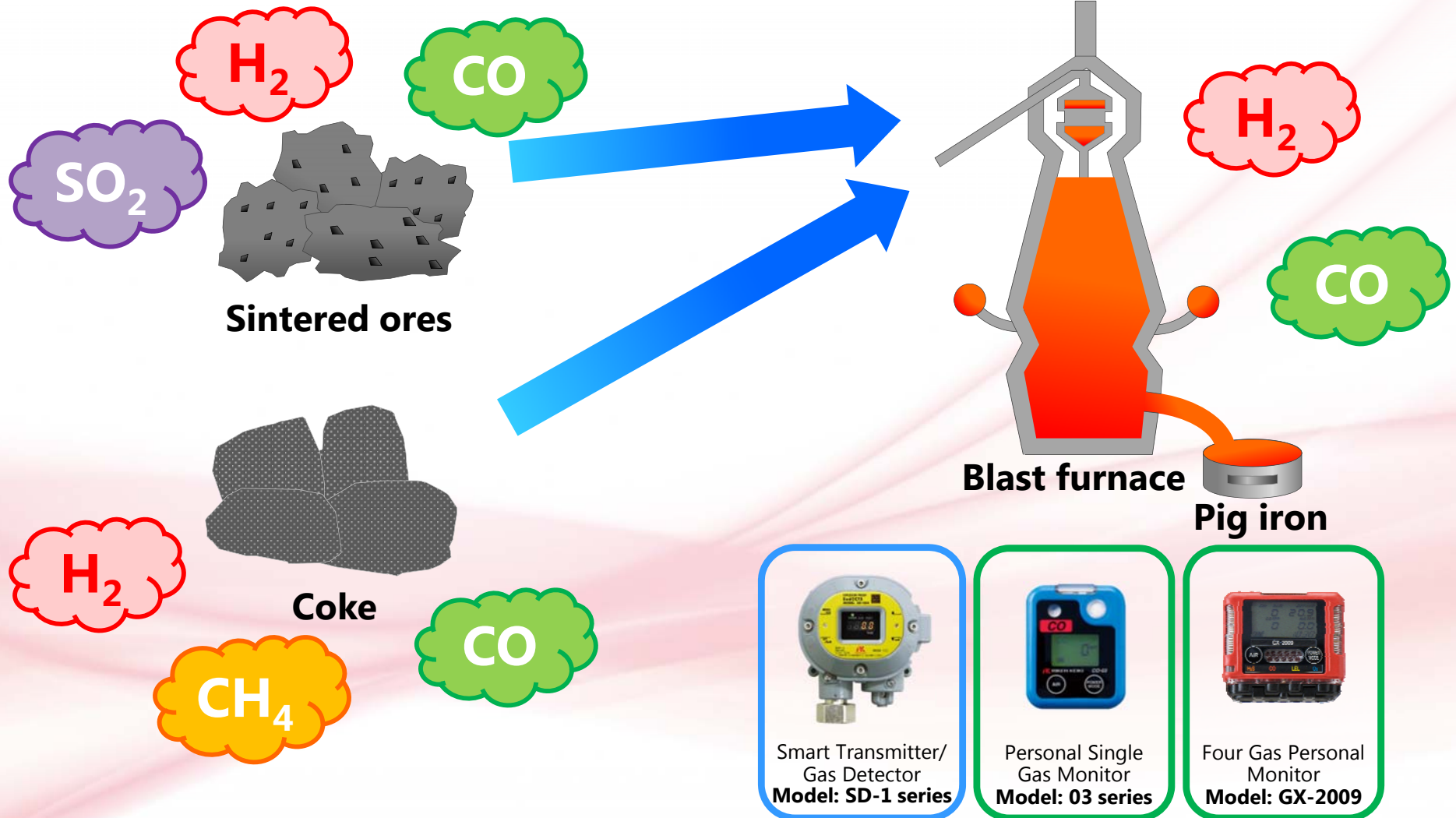


## 2-2. Pig iron making

**Description:** In a blast furnace, iron ores, limestone, and coke (made from coal) are alternately supplied from the top. Heated air is injected through a nozzle called the tuyere in the lower area. The furnace interior reaches temperatures of approximately 2,200°C. The molten iron becomes pig iron.

**Hazardous risks:** Hydrogen ( $H_2$ ), methane ( $CH_4$ ), carbon monoxide ( $CO$ ), sulfur dioxide ( $SO_2$ ), and other gases generated from the sintered ores, coke, and blast furnace can cause explosions or poisoning.

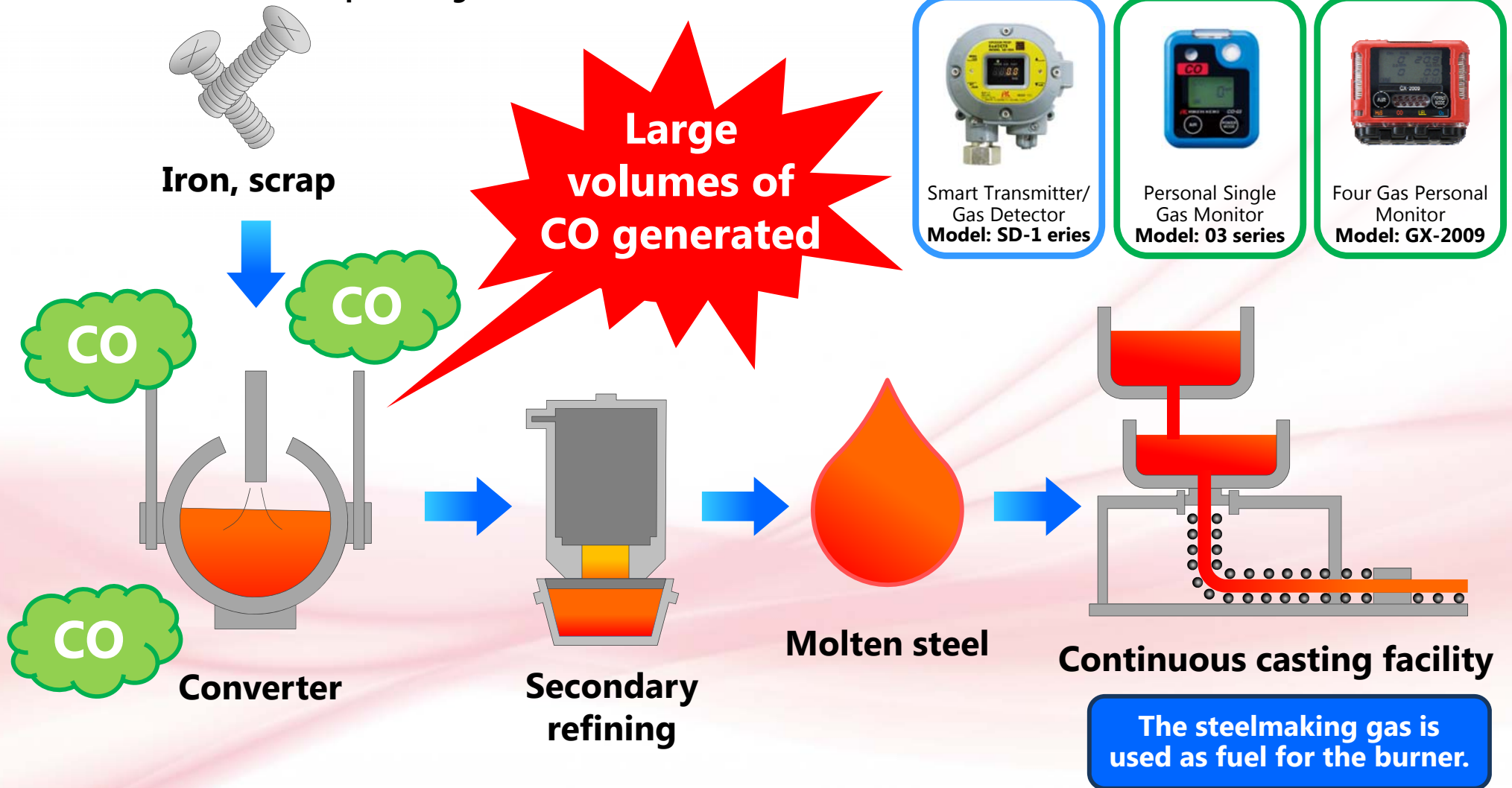
⇒ Detecting combustible gases and  $CO$  and  $SO_2$  to prevent poisoning



# 2-3. Steelmaking

**Description:** Impurities like sulfur and phosphor are removed from the pig iron, which is then transferred to the converter. The iron content approaches 99% once oxygen is injected into the converter to remove carbon. In secondary refining, impurities are further removed to produce steel. Steel is characterized by its toughness and ease of processing.

**Hazardous risks:** Carbon monoxide (CO) leaking from the converter ⇒ Detecting CO to prevent poisoning can cause poisoning.



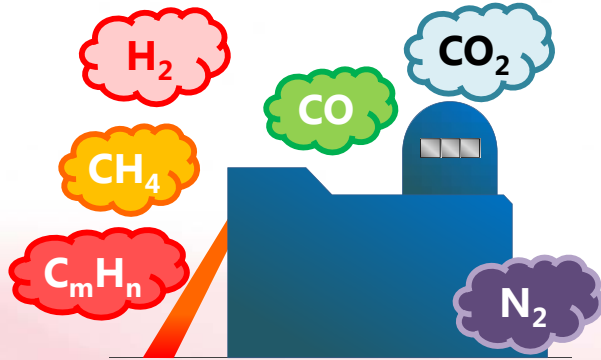
# 3. By-product gases in steelworks

**Description:** Three major types of by-product gases are generated in steelworks. The examples below give the composition of the by-product gases. (By-product gases are reused as fuel on the premises.)

**Hazardous risks:** By-product gases generated in steelworks may cause explosions or poisoning. ⇒ Detecting combustible gases and toxic gases to prevent poisoning

## ① COG (Coke oven gas)

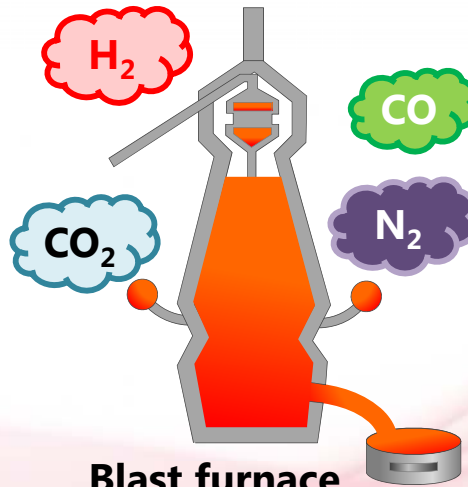
- H<sub>2</sub> : 56vol%
- CH<sub>4</sub> : 30vol%
- C<sub>m</sub>H<sub>n</sub> : 3vol%
- CO : 6vol%
- CO<sub>2</sub> : 2.5vol%
- N<sub>2</sub> : 2.5vol%



Coke plant

## ② BFG (Blast furnace gas)

- H<sub>2</sub> : 4vol%
- CO : 22.5vol%
- CO<sub>2</sub> : 22.5vol%
- N<sub>2</sub> : 51vol%

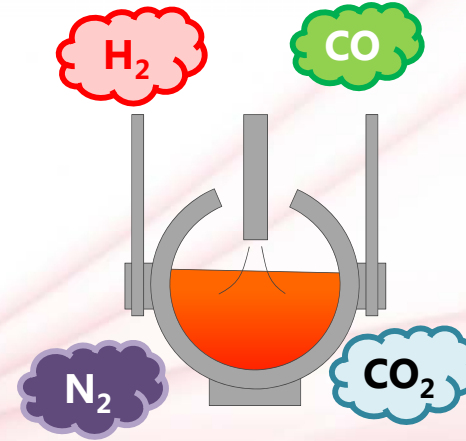


Blast furnace

Pig iron

## ③ LDG (Linz-Donawitz converter gas)

- H<sub>2</sub> : 1vol%
- CO : 68vol%
- CO<sub>2</sub> : 16vol%
- N<sub>2</sub> : 15vol%



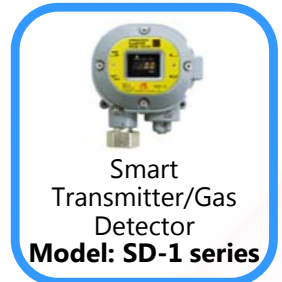
Converter

COG

BFG

LDG

By-product gases



**Energy conversion**

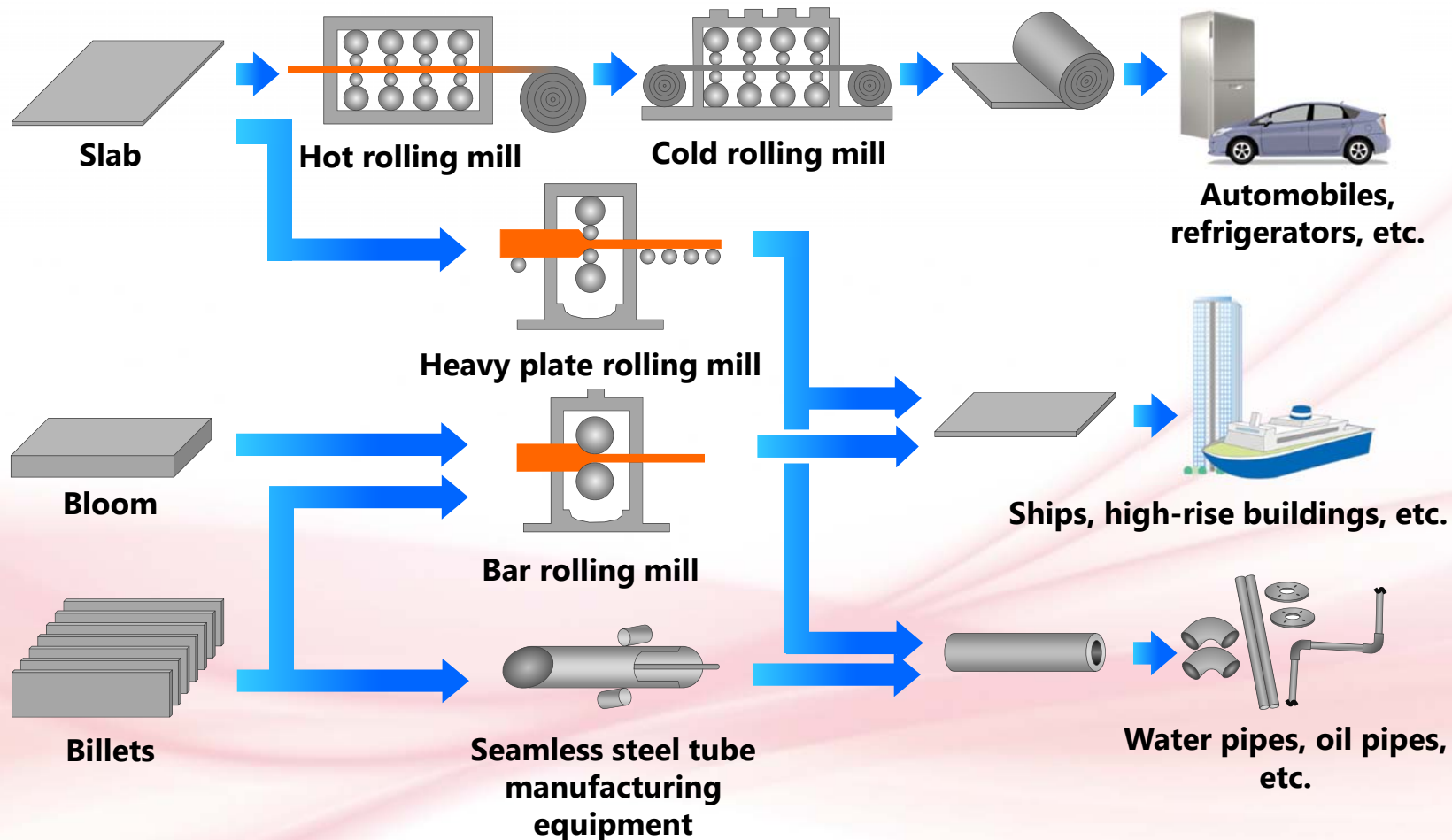
- Boiler
- Power generation facility
- Oxygen plant

# 4. Steel rolling process

**Description:** Steel is processed into plates varying from thin plates of 1 mm or less to thick plates of up to 40 cm. In addition to processing into plates, the strength, properties, and ease of processing may be adjusted. The steelmaking gas is used as fuel gas. Oxygen shortages may occur in the underground pits and other locations.

**Hazardous risks:** Leaks of steelmaking gas used as the fuel gas may cause explosions or poisoning.

⇒ **Detecting combustible gases and carbon monoxide (CO) to prevent poisoning**





# 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>)

# A CO gas leak occurred during testing of measuring instruments in a steelworks blast furnace, resulting in the poisoning of many of those present.

## [Location of accident]

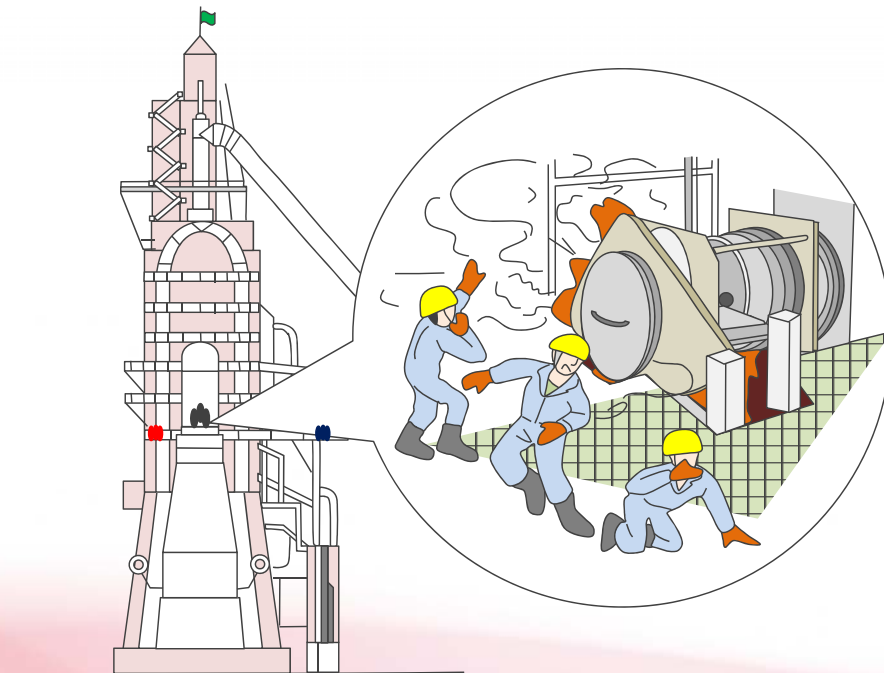
Inside the steelworks blast furnace

## [Cause of accident]

The operator turned on the main power in the electric room, turned off the main circuit switch at the site, and then pressed the Advance button on the measuring instrument. The gas pressure in the furnace caused the measuring instrument to retract. The retraction of the measuring instrument stopped briefly when the operator pressed the Stop button, but resumed when the purge button used to insert the antenna of the measuring instrument into the furnace was pressed. The gas in the furnace leaked through the tire seal from the ball valve intended to prevent gas leaks.

## [Damage/injuries]

Many observing the test at points close to and distant from the control panel were exposed to gas from the furnace and poisoned by carbon monoxide.



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

# Fuel supply was resumed after repairs of a recovery furnace. Welding sparks ignited and caused an explosion of coke oven gas that had leaked into the furnace, resulting in major damage.

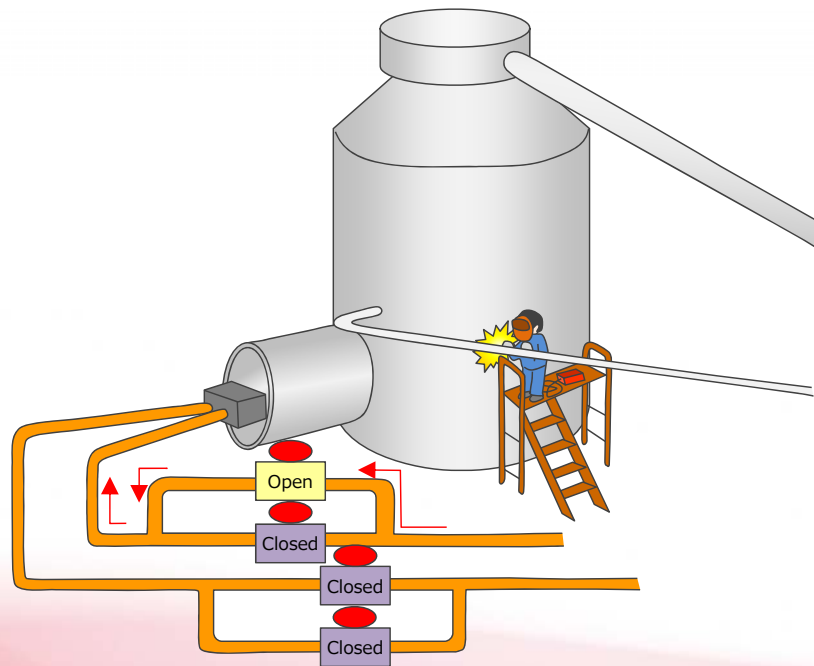


## [Location of accident]

Hydrochloric acid recovery furnace used in the steelmaking process for washing the product

## [Cause of accident]

Following repairs of the roasting furnace (furnace used to decompose iron chloride into hydrochloric acid and iron oxide by thermal decomposition and recover hydrochloric acid), the filling of coke oven gas was completed. To ignite the burner and resume combustion, the operator operated the start switch on the first floor of the roasting furnace to activate the exhaust blower that discharges residual coke oven gas from the furnace. The air blower that supplies air to the burner was then activated. An explosion occurred as the operator was moving to operate the ignition switch on the third floor, before the corresponding switch was operated.



## [Damage/injuries]

The explosion blew off the upper part of the furnace and scattered fragments over surrounding areas. A plumbing worker doing cleanup work on the ground was seriously injured by the fragments. The operator who was in the process of moving to the third floor after operating the start switch on the first floor and a worker doing paint work on the third floor were struck by fragments and sustained injuries.



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

# Carbon monoxide poisoning during cleaning of an absorption tower of desulfurization equipment in steelworks

## [Location of accident]

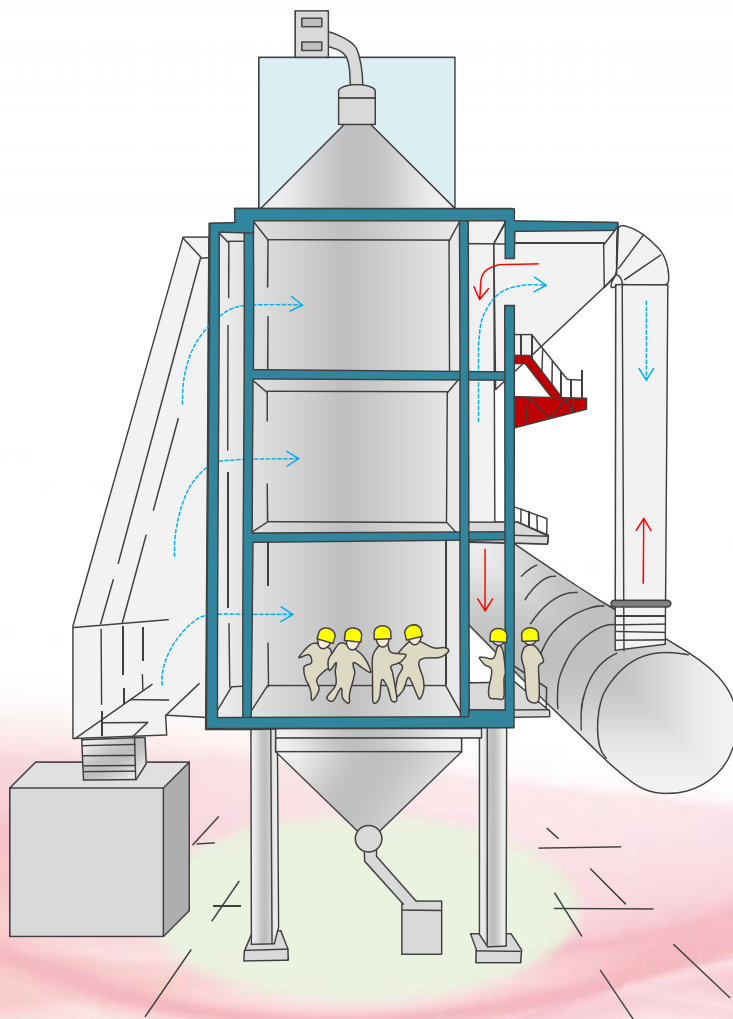
Absorption tower of desulfurization equipment for sintering machine at steelworks

## [Cause of accident]

During the cleaning of the lower part of the desulfurization equipment, the victim and two other workers were positioned outside the inner manhole. Four workers were performing suction work with vacuum hoses in the inner manhole. The steelworks observer detected an unpleasant and irritating odor and suspected exhaust gas had leaked in from the sintering machine. Measurements of concentrations of sulfur dioxide gas, oxygen, and carbon monoxide in the manhole showed an oxygen concentration of 18.8% and carbon monoxide concentrations of 130 ppm. The workers in the manhole were instructed to evacuate.

## [Damage/injuries]

The parties affected were taken to a hospital by private car and examined. Doctors advised hospitalization for the observer and victim. The observer went home that day, while the victim remained hospitalized for a week for carbon monoxide poisoning.



Measuring gas concentrations made it possible to identify concentrations of the toxic gas at an early stage, which resulted in early evacuation and minimized health consequences. Wearing gas detectors on a routine basis enables early detection and improves safety.



# **Product Information**



**SD-1**

**SD-1RI**

(For combustible  
gases)

**SD-1GH**

(For combustible/  
toxic gases)

**SD-1EC**

(For carbon monoxide/  
hydrogen sulfide)

**SD-10X**

(For oxygen)

Smart Transmitter/  
Gas Detector

**Model: SD-1 series**

## Features

- Suitable for use as an explosion-proof product, even in a hydrogen/acetylene atmosphere
- 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 connection.
  - \* Excluding SD-1 (TYPE NC)
- SD-1RI, SD-1EC, and SD-10X 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.



**SD-D58**

(With concentration indicator)



**GD-D58**

(Without concentration indicator)

## Features

- Suitable for use as an explosion proof product even in hydrogen atmospheres
- Equipped with automatic flow rate abnormality detection function
- Integrated assemblies of replacement parts improve maintainability.
- Dustproof/waterproof enclosure (IP 67 equivalent)
- One-person maintenance possible

Flame-proof Suction Type Gas Detector

**Model: SD-D58**

**Model: GD-D58**



**GP-03**

(For combustible  
gases)

**OX-03**

(For oxygen)

**HS-03**

(For hydrogen  
sulfide)

**CO-03**

(For carbon  
monoxide)

## Features

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

Personal Single Gas Monitor

**Model: 03 series**





## Features

- Suitable for use as an explosion-proof product, even in a hydrogen/acetylene atmosphere
- IP 67 equivalent protection for safe use in outdoor work
- Three alarm lamps and two alarm buzzers oriented in different directions to alert both the operator and those in surrounding areas
- 95+ dB buzzer audible even in the noisiest surroundings
- Simultaneous display of gas concentrations of four components on large LCD screen
- Also equipped with clock display and data logger functions

Four Gas Personal Monitor

**Model: GX-2009**



# **International Agents**

## **International Agents**



**North America**

**South America**

**Asia and Pacific**

**Russia and Central Asia**

**Europe**

**Middle East**

**Africa**



RIKEN KEIKI

## International agents (table of contents)

<b>North America</b>	<a href="#">U.S.A.</a>				
<b>South America</b>	<a href="#">Brazil</a>	<a href="#">Argentina</a>	<a href="#">Peru</a>	<a href="#">Chile</a>	<a href="#">Uruguay</a>
<b>Asia and Pacific</b>	<a href="#">China</a>	<a href="#">South Korea</a>	<a href="#">Taiwan</a>	<a href="#">Singapore</a>	<a href="#">Malaysia</a>
	<a href="#">Indonesia</a>	<a href="#">Thailand</a>	<a href="#">India</a>	<a href="#">Vietnam</a>	<a href="#">Philippines</a>
	<a href="#">Australia</a>				
<b>Europe</b>	<a href="#">Germany</a>	<a href="#">Greece</a>	<a href="#">THE NETHERLANDS</a>	<a href="#">Norway</a>	<a href="#">Turkey</a>
	<a href="#">U.K.</a>				
<b>Middle East</b>	<a href="#">U.A.E.</a>	<a href="#">Israel</a>			
<b>Africa</b>	<a href="#">South Africa</a>		<b>Russia and Central Asia</b>	<a href="#">Russia</a>	



## International agents (U.S.A.)

### **RKI INSTRUMENTS, INC.**

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TEL : +1-510-441-5656

FAX : +1-510-441-5650

E-MAIL : [bob@rkiinstruments.com](mailto:bob@rkiinstruments.com), [sandra@rkiinstruments.com](mailto:sandra@rkiinstruments.com)

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

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

## International agents (BRAZIL)

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TEL : +55-21-2590-3496

FAX : +55-21-2270-6390

E-MAIL : [hideko@nakayama.com.br](mailto: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](mailto: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](mailto: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](mailto: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](mailto:marketing@electronicmarine.cl)

PERSON : Alejandra Palominos (Marketing Manager)

WEBSITE : <http://www.electronicmarine.cl>

## International agents (URUGUAY)

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ADDRESS : Carlos María Morales 934, 11200 Montevideo, Uruguay

TEL : 598-2410-1128

FAX : 598-2410-1128

E-MAIL : [microsur@microsur.org](mailto:microsur@microsur.org)

PERSON : Dra.Nermys Hernandez

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



## International agents (CHINA)

### RIKEN KEIKI COMMERCIAL(SHANGHAI) CO., LTD.

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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@rkcc.net](mailto:dl@rkcc.net) (Ms. Sun Jun)  
[dl101@rkcc.net](mailto:dl101@rkcc.net) (Ms. Qu shuai)  
[dl102@rkcc.net](mailto:dl102@rkcc.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](mailto: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](mailto: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](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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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)

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## 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](mailto:zerv@otenet.gr)

PERSON : MR. JOHN ZERVOUDAKIS

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## International agents (THE NETHERLANDS)

### GMS Instruments B.V.

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

TEL : +31102938860

E-MAIL : [sales@gms-instruments.nl](mailto: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](mailto:dag@bruusgaard.no)

PERSON : MR. DAG MAARTMANN

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



## International agents (TURKEY)

### DOGANAK COLL. CO.

ADDRESS : KARAKOY, OKCUMUSA CADDESİ, IPEK CIKMAZI,  
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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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

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

E-MAIL : [tairiku.alpeev@co.ru](mailto:tairiku.alpeev@co.ru), [ofistrk@online.ru](mailto:ofistrk@online.ru)

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





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