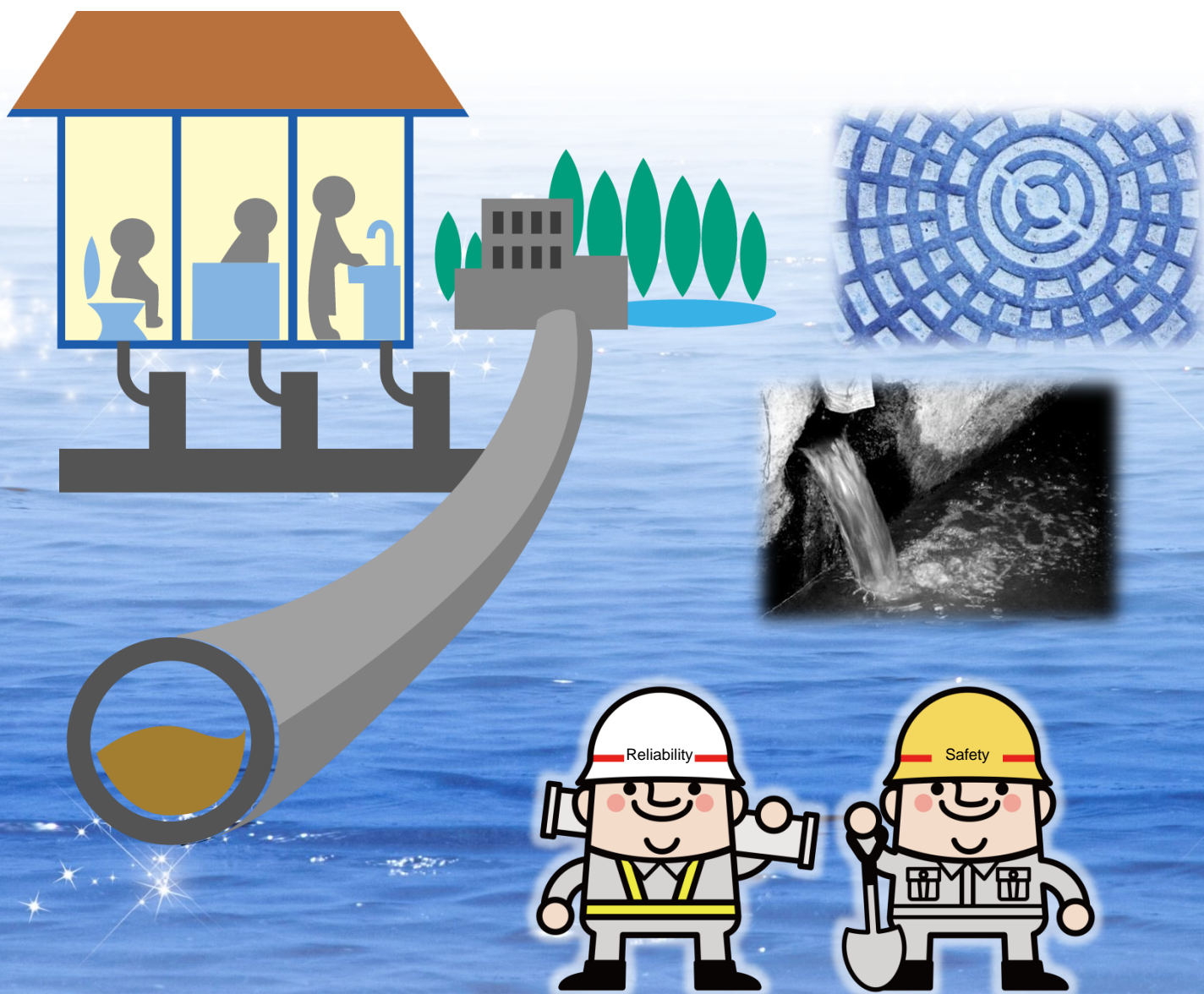




Safety Support for Sewer System Gas Detector & Alarm

Application Introduction



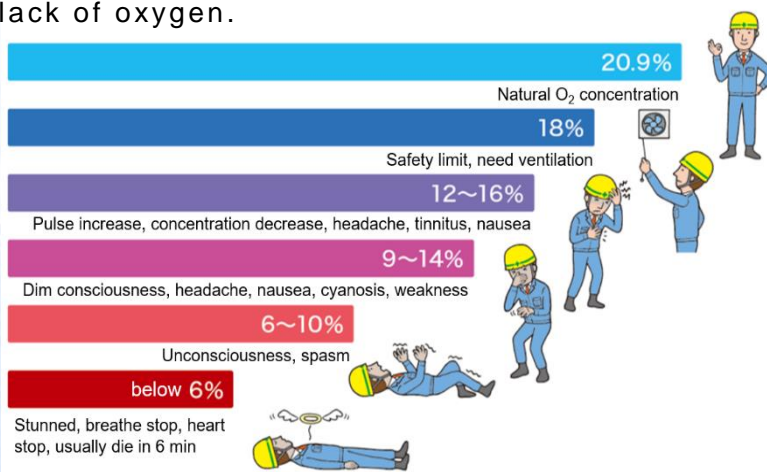
*Safety support for sewer workers
Riken Keiki gas detectors*

Dangers in the sewer related facilities

To do the inspection or clean up works of sewer pipes, workers usually get into the sewer pipe from manholes. It is supposed to be dangerous that those places without ventilation may cause serious hypoxia problem or H₂S poisoning. Furthermore, according to the information from the Ministry of Health, Labor and Welfare of Japan, in the 20 years of 1997 to 2016, the oxygen deficiency and H₂S poisoning accidents occurred most frequently during the summer.

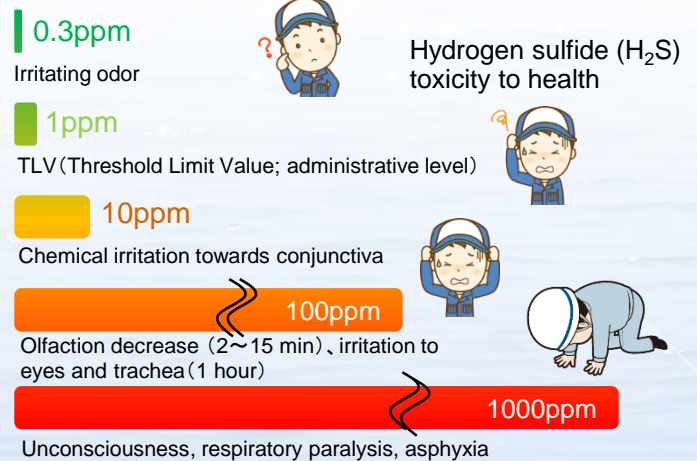
Oxygen deficiency

Oxygen deficiency: O₂ concentration below 18 %. O₂ is usually contained of 20.9 % in air. Which below 18 % (safety limit) may cause serious problems to our health. Additionally, those who go to help the workers that faint due to the oxygen deficiency might also fall because of the lack of oxygen.



Danger of H₂S toxicity

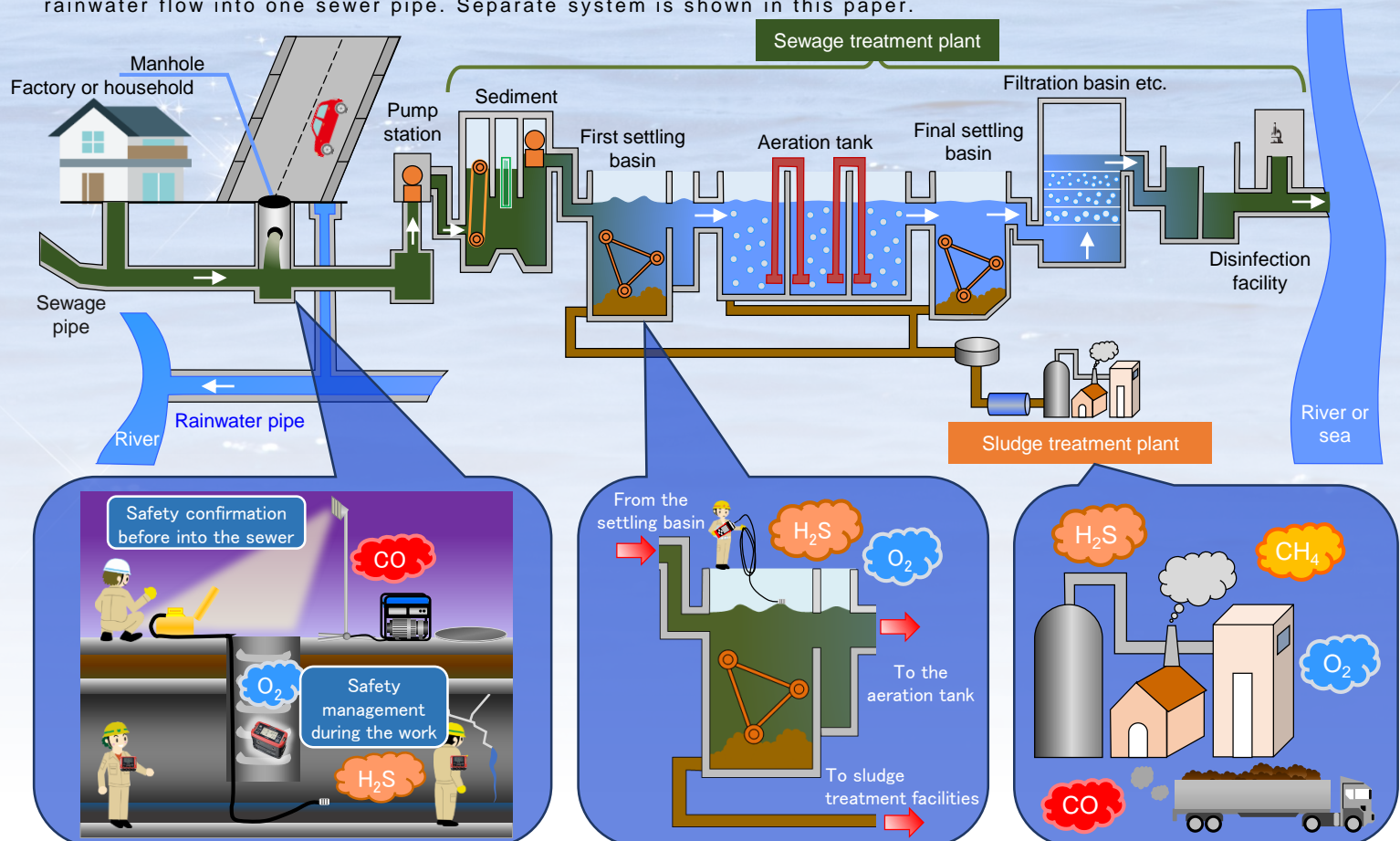
Hydrogen sulfide (H₂S) is a kind of highly toxic gas which holds a extreme low administrative level below 1 ppm. It is very dangerous when the concentration of H₂S over 1000 ppm, which may cause a fatal accident to those employers work around.



The overall progress of separate sewage treatment plant

Residential or industrial wastewater, and rainwater is gathered as sewage through the sewer underneath ground to the sewage treatment plant. The following figures show the progress of sewage treatment.

※It is known that sewage flows through sewers in two ways, combined system and separate system. Separate system is which sewage and rainwater flow through different sewer pipes, while combined system means that sewage and rainwater flow into one sewer pipe. Separate system is shown in this paper.



Safety Support for Sewer System

Riken Keiki gas detectors recommended

Before / during the work in sewers,
reliable gas detectors for safety management

Model : GX-2000 (Portable)

Model : GX-8000 (Portable)

【Specifications】※ Request product catalogs for more detailed information



Model : GX-2000

Model : GX-8000

GX-2000

External alarm available
2-direction alert
simultaneously.

GX-8000

Loud volume alarm.
Pumped in type portable
gas detector.

Model	GX-2000	GX-8000
Target gas	Combustible gas / O ₂ / H ₂ S / CO	
Detection range (Service range)	CH ₄ : 0 ~ 100 %LEL (-) O ₂ : 0 ~ 25.0 vol% (-) H ₂ S : 0 ~ 30.0 ppm (30.5 ~ 150.0 ppm) CO : 0 ~ 100 ppm (101 ~ 300 ppm)	HC / CH ₄ / H ₂ / C ₂ H ₂ : 0 ~ 100 %LEL [NC] / ~ 100 vol% [TE] O ₂ : 0 ~ 25.0 vol% (~ 40.0 vol%) H ₂ S : 0 ~ 30.0 ppm (~ 100.0 ppm) CO : 0 ~ 150 ppm (~ 500 ppm)
Warning value	Based on the target gas	
Sampling	Pumped in	
Alarm mode	Gas alarm / fault alarm	
Ex / water proof	- / Splash proof (designed to JIS C0920 I type)	Intrinsically safe / designed to IP67
Certifications	-	TIIS ATEX IECEx CE MED HK
Power supply	AC supply [AC 100 V±15 V(50 / 60 Hz) ※with 5 m automatic rolling cord] or Alkaline batteries [C batteries × 4 ※Ni-Cd rechargeable battery available (optional)]	Li-ion battery unit (standard) or AA batteries × 3 (optional)
Duration	With alkaline batteries : 10 hours (25 °C / no alarm / no light) With Ni-Cd chargeable batteries : 8 hours (25 °C / no alarm / no light / fully charged)	With Li-ion battery unit : 12 hours (25 °C / no alarm / no light / fully charged) With alkaline batteries : 6 hours (25 °C / no alarm / no light)
Dimensions & weight	390 (W) × 260 (H) × 230 (D) mm (without protrusion) Instrument weight : 2.5 kg Rolling cord : 2.5 kg Case : 2 kg	154 (W) × 81 (H) × 127 (D) mm (without protrusion) With Li-ion battery unit : 1.1 kg With Alkaline batteries : 1.0 kg
Temperature & humidity	-10 ~ +40 °C Under 95 %RH (no condensing)	-20 ~ +50 °C Under 95 %RH (no condensing)

Identification of gas leak in sewer pipes

Portable gas detector & alarm

Model : GX-6000 (Portable)

Model : GX-2012 (Portable)

【Specifications】※ Request product catalogs for more detailed information



Model: GX-6000

Model : GX-2012

GX-6000

Maximum 6 gas species
(HCN, NH₃ and etc.)
detection with 1 monitor.
Real-time indicator.

GX-2012

Protection from oxygen
deficiency explosion and
H₂S poisoning in sewer
works.

Model	GX-6000	GX-2012
Target gas	Combustible gas / O ₂ / toxic gas / VOC	Combustible gas / O ₂ / H ₂ S / CO
Detection range (Service range)	Based on target gas	HC / CH ₄ : 0 ~ 100 %LEL (-) CH ₄ : 0 ~ 100 vol% (-) O ₂ : 0 ~ 25.0 vol% (~ 40.0 vol%) H ₂ S : 0 ~ 30.0 ppm (-) CO : 0 ~ 150 ppm (~ 500 ppm)
Warning value	Based on target gas	
Sampling	Pumped in	
Alarm mode	Gas alarm / malfunction alarm / etc. [panic alarm / man down alarm (optional)]	Gas alarm / malfunction alarm
Ex / water proof	Intrinsically safe / designed to IP67	
Certifications	TIIS ATEX IECEx CE	
Power supply	Li-ion battery unit or AA batteries × 3	AA batteries × 3 (standard) or Li-ion battery unit (optional)
Duration	With Li-ion battery unit : 14 hours (fully charged) With alkaline batteries : 8 hours (using new batteries)	With alkaline batteries : 15 hours (25 °C / no alarm / no light) With Li-ion battery unit : 10 hours (25 °C / no alarm / no light / fully charged)
Dimensions & weight	70 (W) × 201 (H) × 54 (D) mm (without protrusion) With Li-ion battery unit : 500 g With alkaline batteries : 450 g	71 (W) × 173 (H) × 43 (D) mm (without protrusion) 360 g
Temperature & humidity	-20 ~ +50 °C Under 95 %RH (no condensing)	

Oxygen deficiency accident prevention before / during the work with 1 monitor

Model : OX-08 (portable type for O₂)



【Specifications】※ Request product catalogs for more detailed information

Model	OX-08
Target gas	Oxygen
Detection range	O ₂ : 0 ~ 40.0 vol%
Warning value	1 st alarm / 2 nd alarm : 18.0 vol% / over range alarm : 40.0 vol%
Sampling	Diffusion
Alarm mode	Gas alarm / malfunction alarm
Ex / water proof	Intrinsically safe / designed to IP67
Certifications	TIIS
Power supply	AA batteries × 2
Duration	20,000 hours (25 °C / no alarm / no light / with new batteries)
Dimensions & weight	69 (W) × 150 (H) × 53 (D) mm (without protrusion) 330 g (include remote cable 5 m / batteries / belt clip)
Temperature & humidity	-20 ~ +50 °C Under 10 ~ 95 %RH (no condensing)

Monitoring before work / portable real-time indicator.
2 ways detection available

Real-time portable gas monitors for sewer workers

Model : GX-2009 (pocketable for 4 gases)

Model : OX-03 (pocketable type for oxygen)

Model : HS-03 (pocketable type for H₂S)

【Specifications】※ Request product catalogs for more detailed information



Model : GX-2009

Model : OX-03

Model : HS-03

GX-2009

Palm size.
Simultaneously indicate

4 gases (HC / O₂ / H₂S / CO)



OX-03, HS-03

OX-03 for O₂
HS-03 for H₂S
Single species gas monitor



Model	GX-2009	OX-03	HS-03
Target gas	Combustible gas / O ₂ / H ₂ S / CO	Oxygen	H ₂ S
Detection range (service range)	HC/CH ₄ : 0 ~ 100 %LEL (-) O ₂ : 0 ~ 25.0 vol% (25.1 ~ 40.0 vol%) H ₂ S : 0 ~ 30.0 ppm (-) CO : 0 ~ 150 ppm (151 ~ 500 ppm)	0 ~ 40.0 vol% (-)	0 ~ 30.0 ppm (-)
Warning value	Based on the target gas	L alarm : 19.5 vol% LL alarm : 18.0 vol% OVER : 40.0 vol%	1 st : 1.0 ppm 2 nd : 10.0 ppm TWA : 1.0 ppm STEL : 5.0 ppm OVER : 30.0 ppm
Sampling	Diffusion		
Alarm mode	Gas alarm / fault alarm		
Ex / water proof	Intrinsically safe / designed to IP67		
Certifications	TIIS HK ATEX CE MED	TIIS ATEX IECEx CE	
Power supply	Specific Ni-MH battery	AAA batteries × 2 or AAA Ni-H batteries × 2 (rechargeable)	
Duration	20 hours (25 °C / no alarm / no light / fully recharged)	With alkaline batteries : 3000 hours (25 °C / no alarm / no light) With rechargeable batteries : 2400 hours (25 °C / no alarm / no light / fully recharged)	
Dimensions & weight	76 (W) × 69 (H) × 26 (D) mm (without protrusion) 130 g (main instrument)	54 (W) × 67 (H) × 24 (D) mm (without protrusion) 80 g (without clip)	
Temperature & humidity	-20 ~ +49 °C Under 85 %RH (no condensing)	-20 ~ +50 °C Under 95 %RH (no condensing)	-20 ~ +50 °C 16 ~ 85 %RH (no condensing)

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※ The information in this catalog may be changed without notification.