Quality Management System <ISO 9001>

For the continuous development of our quality management system, we obtained ISO 9001 certification, the global standard for quality management systems, in 1996. As a manufacturer of safety equipment, we will continue to strive for continuous improvement of our quality management system and deliver high quality products to our customers.

Environmental Management System <ISO14001>

We acquired ISO 14001 certification, the global standard for environmental management systems, in 2000 with the aim of becoming an environmentally friendly company. We are working to develop products that do not place a burden on the environment from development and manufacturing to transportation, use, and disposal, as well as products that contribute to the promotion of carbon neutrality.

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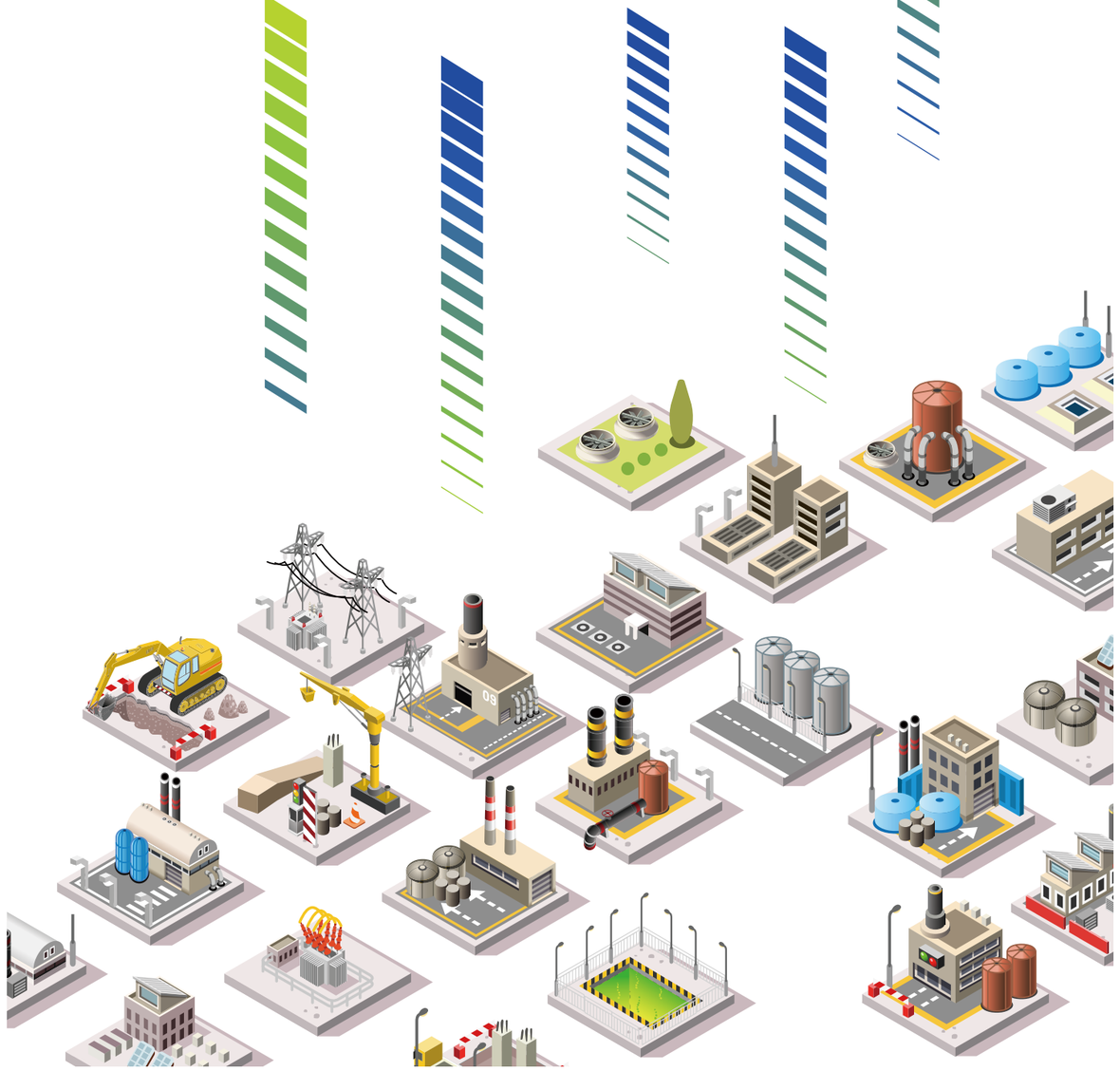
SAFETY WARNING
Carefully read the instruction manual prior to use.
Select and use the device designed to detect the required type of gas. Use of a wrong sensor type may cause an accident.

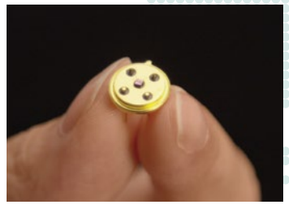
(P)202208A500

COSMOS

Portable Gas Detectors

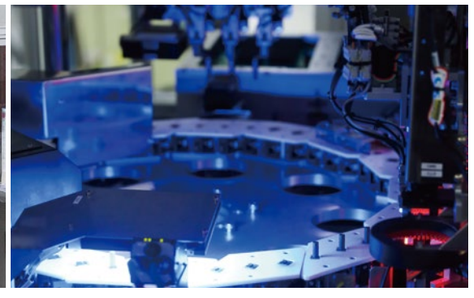
PRODUCT GUIDE





About New Cosmos Electric

1. New Cosmos Electric, succeeded in developing the world's first residential gas alarm in 1964, and still has the largest market share in Japan. We also have large shares in the field of industrial gas detectors and alarm systems.
2. We offer total safety solutions for gas sensors, including gas sensors development, manufacturing, sales, and after sales support for products that feature gas sensors.
3. In 2015, we set up COSMOS SENSOR CENTER, the world's largest gas sensor research and manufacturing facility.
4. With a broad network in Japan as well as in countries around the world, we have proven track record of widespread adoption of its products.



CONTENTS

PORTABLE GAS DETECTOR
XP-3000II SERIES

Combustible Gas　O_2 Oxygen　Others

Appearance

Features

- **Convert to 32 types gas's concentration**

  *Only for XP-3310II, XP-3318II, XP-3360II-W and XP-3368II-W units, in which GAS1 (target gas) is set to methane, isobutane or propane.
  *Converted gas concentration is only an estimate and no guarantee is provided.

Convertible Gas List

Acetone	Cyclohexane	Ethyl acetate	n-Hexane	Methanol	Propane	Toluene
Acetylene	Cyclopentane	Ethylbenzene	Hydrogen	Methylcyclohexane	Propy lacetate	o-Xylene
Benzene	DME	Ethylene	IPA	MIBK	Propylene	m-Xylene
n-Butane	Ethane	Gasoline	MEK	n-Pentane	THF	p-Xylene
i-Butane	Ethanol	n-Heptane	Methane			

- **Waterproof IP67**
- **Enable to measure in "%LEL" and "ppm" (for XP-3360II-W and XP-3368II-W)**


Waterproof and Dustproof, IP67

LCD


With Flashlight


Attachment (short probe)


Alligator Clip

Lineup

Target Gas \ Model		XP-3310II	XP-3360II	XP-3360II-W	XP-3340II	XP-3318II	XP-3368II	XP-3368II-W	XP-3380II (-E)
Combustible Gas	%LEL	○		○		○		○	
	ppm		○	○			○	○	
	Vol%				○				
Oxygen						○	○	○	○

Specifications

Sampling Method	Internal pump
Power Source	・4 x AA Alkaline batteries, Approx. 15 hours ・Rechargeable nickel metal hydride batteries, Approx. 15 hours
Operating Temperature & Humidity	-20 to +50°C 95 %RH. No condensation
Approvals	ATEX: ⟨Ex⟩ II 1G Ex ia da IIC T4 Ga *1 IECEx: Ex ia da IIC T4 Ga CE (ATEX, EMC, RoHS, RE and LVD directives) IP67 UL: Class 1, Division 1, Groups A, B, C and D, Class 1, Zone 0 AEx da ia IIC Ga (Other than XP-3380II)
Dimensions	W91 × H164 × D44 mm
Weight	Approx. 460 g
Accessories	Gas sampling tube (1 m), Shoulder strap, Drain filter, Filter element, 4 x AA Alkaline batteries (or 4 x Rechargeable nickel metal hydride AA batteries), 3 x Screen protector films

Model	Multi Gas Detector					
	XP-3368II-W		XP-3368II		XP-3318II	
Target Gas	Combustible gas /Solvent vapor	Oxygen	Combustible gas /Solvent vapor	Oxygen	Combustible gas /Solvent vapor	Oxygen
Sensor Type	Catalytic	Galvanic cell	Catalytic	Galvanic cell	Catalytic	Galvanic cell
Measuring Range (Reference Indication)	0.0–100.0 %LEL (100.1–110.0 %LEL) Enable to display in ppm.	0–25 vol% (25.1–50.0 vol%)	0–5000 ppm or 0–10000 ppm (5001–5500 ppm or 10001–11000 ppm)	0–25 vol% (25.1–50.0 vol%)	0–100 %LEL (100.1–110.0 %LEL)	0–25 vol% (25.1–50.0 vol%)
Display Resolution	0.1 %LEL or 1 ppm	0.1 vol%	1 ppm	0.1 vol%	0.1 %LEL	0.1 vol%
Alarm Set Value	20 %LEL	18 vol%	250 ppm or 500 ppm	18 vol%	20% LEL	18 vol%
Response Time	T90: 30 sec.	—	T90: 30 sec.	—	T90: 30 sec.	—

Model	Combustible Gas Detector				Oxygen Detector
	XP-3360II-W	XP-3360II	XP-3310II	XP-3340II	XP-3380II (-E) *2
Target Gas	Combustible gas/Solvent vapor			Combustible gas/Inert gas	Oxygen
Sensor Type	Catalytic			Thermal conductivity	Galvanic cell
Detection Range (Reference Indication)	0.0–100.0 %LEL (100.1–110.0 %LEL) Enable to display in ppm.	0–5000 ppm or 0–10000 ppm (5001–5500 ppm or 10001–11000 ppm)	0–100 %LEL (100.1–110.0 %LEL)	0–100.0 vol%	0–25 vol% (25.1–50.0 vol%)
Display Resolution	0.1 %LEL or 1 ppm	1 ppm	0.1 %LEL	0.1 vol%	0.1 vol%
Alarm Set Value	20 %LEL	250 ppm or 500 ppm	20 %LEL	50 vol%	18 vol%
Response Time	T90: 30 sec.			T90: 60 sec.	—

*1. Other than XP-3380II model, when using AA Alkaline batteries. Please contact us for full information. *2. With cooling drain filter

GAS LEAK DETECTOR
XP-702IIIS

Combustible Gas CFC

Features
- Trace gas is detectable by high sensitivity sensor
- Auto-zeroing, automatic stop pump function
- Refrigerant gas can be detected

Target Gas

Refrigerant	R22, R32, R404A, R407C, R600a (i-B), R410A, etc.
Combustible Gas	Methane, i-butane, Hydrogen, Ammonia, Propane, Benzene, Acetylene, EO, Ethylene, Ethan, Butadiene, etc.

With Flashlight

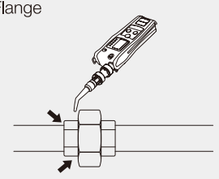
LCD

Specifications

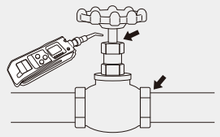
Model	XP-702IIIS-A	XP-702IIIS-B	XP-702IIIS-F
Target Gas	2 combustible gases	1 combustible gas	Refrigerant and 1 combustible gas
Sensor Type	Hot-wire semiconductor		
Sampling Method	Internal Pump		
Detectable Leak Rate	Methane, LPG 3.3×10-6 Pa.m3/s		R-407C 12.4 g/y, R-410A 11.2 g/y
Detectable Concentration	10 ppm		30 ppm
Response time	≤5 sec. except Refrigerant		
Power Source	2 × AA Alkaline batteries, Approx.12 hours		
Operating Temperature & Humidity	-20°C~50°C , 30 to 85 %RH		
Approvals	Ex ia IIB T3 Ga (TIIS intrinsically safety) UL: Class 1, Division 1, Groups C and D, T3 Class 1, Zone 0, AEx ia IIB T3 Ga Japan Ex: Ex ia IIB T3 Ga		
Dimensions	W38 × H135 × D32 mm		
Weight	Approx.190 g		
Accessories	Soft case, Drain filter, Filter element, Gas prove, Dust filter, 2×AA Alkaline batteries		
Options	Annealed copper tube, Gas collector, etc.		

Example of Use

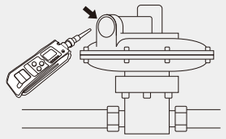
Flange



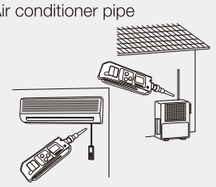
Valve



Reducing valve



Air conditioner pipe



DIGITAL OXYGEN INDICATOR
XO-326IIs

O_2 Oxygen

XO-326IIsA

XO-326IIsB

XO-326IIsC

Features
- Continuously for up to 15,000 hours with 2 × AA Alkaline batteries
- Automatic air adjustment
- Sensor Separated Type can detect oxygen

Specifications

Model	XO-326IIsA	XO-326IIsB	XO-326IIsC
Cable Length	5 m	1 m (spiral cable)	10 m
Target gas	Oxygen		
Sensor Type	Galvanic cell		
Detection Range (Reference Indication)	0 to 25.0 vol% (25.1 to 40.0 vol%)		
Display Resolution	0.1 vol%		
Alarm Set Value	1st: 19.5 vol% 2nd: 18.0 vol%		
Response Time	20 sec.		
Power Source	2 x AA Alkaline batteries, Approx. 15,000 hours		
Approvals	Ex ia II CT3 X (TIIS)		
Operting Temperature & Humidity	-10 to +40°C 30 to 85 %RH		
Dimensions	W66 × H170 × D29 mm	W66 × H120 × D29 mm	W66 × H200 × D29 mm
Weight	Approx. 340 g	Approx. 265 g	Approx. 410 g

O_2/H_2S INDICATOR
XOS-326

O_2 Oxygen

Toxic Gas

Features
- Sensor Separated Type can detect oxygen and hydrogen sulfide
- Waterproof sensor part
- 3 types of alarms: buzzer, alarm lamp, flash LCD lamp of sensor part

Specifications

Model		XOS-326	
Target gas		Oxygen	Hydrogen sulfide
Sensor Type		Galvanic cell	Electrochemical
Detection Range (Reference Indication)		0.0 to 25.0 vol% (25.1 to 99.9 vol%)	0.0 to 30.0 ppm (30.5 to 50.0 ppm)
Display Resolution		0.1 vol%	0.5 ppm
Alarm Set Value	1st	19.5 vol%	10.0 ppm
	2nd	18.0 vol%	15.0 ppm
Response Time		≤20s sec. (90%)	≤30s sec. (90%)
Operating Temperature		-10 to 40°C	
Power Source		2 × AA alkaline batteries, Approx. 50 hours	
Dimensions		Main unit: W66 × H195 × D29 mm Sensor part: Φ44 × H75 mm Sensor cable: 5 m	
Weight		Approx. 450 g	
Accessories		Soft case, Sholder strap, 2 × AA Alkaline batteries, 2 × Filter element	

PERSONAL CO/O_2/H_2S MONITOR
XX-2200 SERIES

O_2 Oxygen

Toxic Gas

Features
- Uses continuously for 5,000 hours
- 3 types of alarms : loud buzzer, alarm lamp and vibration
- Available with TWA (Time Weighted Average) concentration display


Safety-Pin Adaptor


Leather Case (optional)


Heat Resistant Leather Case (optional)


Simple Inspection Jig (optional)


Helmet Clip (optional)

Specifications

Model		XOC-2200	XOS-2200	
		XC-2200	XO-2200	XS-2200
Target gas		Carbon Monoxide	Oxygen	Hydrogen Sulfide
Sensor Type		Electrochemical	Galvanic cell	Electrochemical
Detection Range (Reference Indication)		0 to 300 ppm (300 to 2000 ppm)	0 to 25 vol% (25 to 50 vol%)	0 to 30.0 ppm (30.1 to 100 ppm)
Display resolution		1 ppm	0.1 vol%	0.1 ppm
Alarm Set Value	1st	50 ppm	19.5 vol%	10.0 ppm
	2nd	150 ppm	18.0 vol%	15.0 ppm
Response Time		30 sec.	20 sec.	30 sec.
Approvals		Ex ib IIB T3 (TIIS) CE		
Operting Temperature & Humidity		-10 to +40°C, 30 to 90 %RH		
Power Source		1 × AAA Alkaline battery, Approx. 5,000 hours		
Dimensions		W65 × H64 × D22 mm		
Weight		Approx. 75 g		
Accessories		1 × AAA Alkaline battery, 1 × Safety pin adaptor		
Options		Leather case, Heat resistant leather case, Simple inspection jig, Helmet clip, etc.		

MULTI-GAS DETECTOR
XA-4000II SERIES

Combustible Gas

O_2 Oxygen

Toxic Gas

Features
- 40 hours or more of continuous operation with a single AAA battery (when used in long-life mode)
- Expected Sensor life of 3 years
- 2 way batteries (alkaline battery unit or rechargeable battery unit)


Waterproof and Dustproof, IP67


Alligator Clip


Leather Case (optional)


Data Logger Kit (optional)


Pump Unit (optional)

Specifications

Model		XA-4000II			
Target Gas		Combustible Gas (Methane or LPG)	Oxygen	Hydrogen Sulfide	Carbon Monoxide
Sensor Type		Catalytic	Galvanic cell	Electrochemical	Electrochemical
Detection Range (Reference Indication)		0 to 100 %LEL (101 to 110 %LEL)	0 to 25.0 vol% (25.1 to 50.0 vol%)	0 to 30.0 ppm (30.1 to 50.0 ppm)	0 to 300 ppm (301 to 2000 ppm)
Display Resolution		1 %LEL	0.1 vol%	0-35 ppm: 0.1 ppm 35-150 ppm: 0.5 ppm	0-350 ppm: 1 ppm 350-2000 ppm: 5 ppm
Alam Set Value	1st	10 %LEL	19.5 vol%LEL	10.0 ppm	50 ppm
	2nd	30 %LEL	18.0 vol%LEL	15.0 ppm	150 ppm
Operating Temperature & Humidity		-20 to +50°C, 30 to 85 %RH (non condensing)			
Power Source		1 × AAA alkaline battery, Approx. 40 hours (long-life mode) Rechargeable nickel metal hydride AA battery, Approx. 40 hours (long-life mode)			
Approvals		Ex ibd IIC T3 (TIIS) II 1 G Ex ia IIC T3 Ga (ATEX) Class I, Zone 0, AEx ia IIC T3 Hazardous Locations. (UL) IP67			
Dimensions		W70 × H72 × D26 mm			
Weight		Approx. 130 g			
Accessories		Safety-Pin band, 1 x AAA Alkaline battery, 2 × Filter elements			
Options		Pump unit, Alligator clip, Datalogger kit, Leather case, Belt clip			

MULTI-GAS DETECTOR
XP-302M

Combustible Gas
Oxygen
Toxic Gas

Features
- Easy to replace the sensor cartridge
- Sampling tube can be extended up to 30 m
- An external alarm can be connected

Ordering Information
Model Specification code

XP-302M-□-□

Choose one from A - C — Choose one from 1 - 4

A	4-gas (Combustible, Oxygen, Hydrogen sulfide, Carbon monoxide)
B	3-gas (Combustible, Oxygen, Hydrogen sulfide)
C	3-gas (Combustible, Oxygen, Carbon monoxide)

* Combustible : Methane or LPG

Display


Alarm Lamp


8m Sampling Tube (optional)


Leather Case (optional)


Aluminum Case (optional)

Specifications

Model		XP-302M			
Target Gas		Combustible Gas (Methane or LPG)	Oxygen	Hydrogen Sulfide	Carbon Monoxide
Sensor Type		Catalytic	Galvanic cell	Electrochemical	
Sampling Method		Internal Pump			
Detection Range (Reference Indication)		0 to 100 %LEL (101 to 110 %LEL)	0 to 25.0 vol% (25.1 to 50.0 vol%)	0 to 30.0 ppm (30.1 to 150.0 ppm)	0 to 150 ppm (151 to 300 ppm)
Alam Set Value	1st	10 %LEL	19.5 vol%	10.0 ppm	50 ppm
	2nd	30 %LEL	18.0 vol%	15.0 ppm	100 ppm
Response Time *1	with a 1 m sampling tube	<25 sec.	<20 sec.	<30 sec.	<30 sec.
	with an 8 m sampling tube	<40 sec.			
Operating Temperature & Humidity		-10 to +40°C, 95 %RH			
Power Source		4 × AA Alkaline batteries, Approx. 8 hours			
Approvals		Ex ibd II BT3 (TIIS)			
Dimensions		W152 × H152 × D42 mm			
Weight		Approx. 870 g			
Accessories	XP-302M-□-1	1 m sampling tube (probe with filter/moisture trap, spare filters), Leather case			
	XP-302M-□-2	8 m sampling tube (with float), Leather case and carrying case			
	XP-302M-□-3	Aluminum case *2, 8 m sampling tube (with float), External alarm (with 8 m cable), AC adaptor			
	XP-302M-□-4	Aluminum case *2, 8 m sampling tube with tube reel (with float), External alarm with a cable reel (with 8 m cable), AC adaptor			
Options		Datalogger kit, Sampling tube (8 m, 20 m, 30 m)			

*1. T90 *2. Non explosion-proof type

SEMICONDUCTOR GAS DETECTOR
XPS-7II

Toxic Gas

Features
- Detect various toxic gases using simple 'plug-and-play' sensors
- No need to calibrate each time.
- The smallest portable type that can detect NF_3

LCD


Sensor Unit Replacement


Sensor stocker (for six sensor units) [EC-7]

Specifications

Model	XPS-7II
Target Gas	Semiconductor gases
Sensor Type	Electrochemical, Electrochemical + Catalyst conversion
Sampling Method	Internal Pump
Detection Range	As per the attached list
Alarm Set Values	As per specifications
Response time	T60: ≤60 s
Power Source	4 × AA Alkaline batteries Approx. 12 hours Approx. 8 hours(XDS-7NF)
Operating Temperature & Humidity	0 to 40°C, 30 to 85%RH
Dimensions	W62 × H150 × D128 mm
Weight	Approx. 1.3 kg
Approvals	CE (EMC: 2014/30/EU)
Options	AC adaptor, Sensor stocker, Datalogger kit

List of Target gases

TYPE	GAS	RANGE
XDS-7NH	NH_3	100 ppm
XDS-7SH	SiH_4	25 ppm
XDS-7DC	SiH_2Cl_2	25 ppm
XDS-7AH	AsH_3	250 PPB
XDS-7PH	PH_3	1 ppm
XDS-7BH	B_2H_6	50 PPB
XDS-7SE	H_2Se	25 PPB
XDS-7GH	GeH_4	1 ppm
XDS-7CL	Cl_2	5 ppm
XDS-7CF	CF_3	1 ppm
XDS-7HC	HCl	25 ppm
XDS-7HF	HF	10 ppm
XDS-7HB	HBr	10 ppm
XDS-7NO	NO	100 ppm
XDS-7HS	H_2S	50 ppm
XDS-7CO	CO	250 ppm
XDS-7DS	Si_2H_6	25 ppm
XDS-7F2	F_2	5 ppm
XDS-7OZ	O_3	1 ppm
XDS-7SD	SO_2	10 ppm
XDS-7ND	NO_2	10 ppm
XDS-7NF	NF_3	100 ppm

GAS LEAK DETECTOR
XP-703IIID

Toxic Gas

Features
- **Trace gas is detectable by high sensitivity sensor**
- **Auto-zeroing, automatic stop pump function**
- **Toxic gas can be detected**

Specifications

Model	XP-703DIII
Target Gas	Hydrogen, Arsine, Diborane, Silane, Phosphine
Sensor Type	Hot-wire semiconductor
Sampling Method	Internal Pump
Detectable Leak Rate	H_2: 5.07 x 10-7, AsH_3: 2.53 x 10-7, B_2H_6: 1.01 x 10-7, SiH_4: 2.53 x 10-7, PH_3: 1.52 x 10-7 (Pa·m³/s)
Detectable Gas Concentration	H_2: 1.0 ppm, AsH_3: 0.5 ppm, B_2H_6: 0.2 ppm, SiH_4: 0.5 ppm, PH_3: 0.3 ppm
Response time	10 sec.
Power Source	2 × AAA Alkaline batteries, Approx. 12 hours
Operating Pressure	Atmospheric pressure (800 to 1100 hPa)
Operating temperature & humidity	0 to 40 °C, 30 to 85 %RH
Dimensions	W38 × H135 × D32 mm
Weight	Approx. 190 g
Accessories	Soft case, Drain filter, Filter element, Gas probe, Dust filter, Hand strap, 2 × AA Alkaline batteries

GAS LEAK DETECTOR
XP-704III

CFC

Features
- **Trace gas is detectable by high sensitivity sensor**
- **Auto-zeroing, automatic stop pump function**
- **Alternative refrigerant gases can be detected**

Specifications

Model	XP-704III
Target Gas	R-22, R-32, R-404A, R-407C, R-600a, R-410A, R-134a, R-290, HFO-1234yf
Sensor Type	Hot-wire semiconductor
Sampling Method	Internal Pump
Detectable Leak Rate	R-22: 2.84(g), R-32: 1.71(g), R-404A: 3.30(g), R-407C: 3.12(g), R600a: 1.91(g), R410A: 2.82(g), R-134a: 20.09(g), R-290: 1.45(g), HFO-1234yf: 3.74(g) (Pa·m³/s)
Detectable Gas Concentration	5 ppm (R-134a: 30 ppm)
Response time	10 sec.
Power Source	2 × AAA alkaline batteries Approx. 12 hours
Operating Pressure	Atmospheric pressure (800 to 1100 hPa)
Operating temperature & humidity	0 to 40°C, 30 to 85 %RH
Dimensions	W38 × H135 × D32 mm
Weight	Approx. 190 g
Accessories	Soft case, Drain filter, Filter element, Gas probe, Dust filter, Hand strap, 2 × AA Alkaline batteries

ODOR LEVEL INDICATOR
XP-329m

Odor

Features
- **Can detect and visualize various odors**
- **No maintenance, disposable type**
- **Can detect electrolyte of Li-ion battery**

Specifications

Model	XP-329m
Target Gas	Various odors, Odor components
Sensor Type	Tin oxide-based high sensitivity hot wire semiconductor sensor
Sampling Method	Internal Pump
Indicated Value	0 to 999
Operating Temperature & Humidity	0 to 40°C, 10 to 80 %RH
Dimensions	W60 × H140 × D40 mm
Weight	Approx. 300 g
Power Source	3 × AA alkaline batteries or AC adaptor (AC100-240 V) Approx. 10 hours
Accessories	Drain filter, 3 × AA alkaline batteries, Filter elements (10 pcs)
Options	Activated carbon filter (DF-105), Activated carbon (FE-110), AC adapter

ODOR LEVEL INDICATOR
XP-329IIIR

Odor

Features
- **Can detect and visualize various odors**
- **Switchable between continuous monitoring mode with real-time display and batch measurement mode for 1 minute**
- **Equipped with an activated carbon filter for automatic base adjustment**
- **The sensor status is displayed in a bar graph on the screen It is possible to check when maintenance is required**

Specifications

Model	XP-329IIIR
Target Gas	Various odors, Odor components
Sensor Type	Indium oxide-based sensitivity hot wire semiconductor sensor
Sampling Method	Extractive *Extractive flow: 400±150ml/min
Display	LCD digital indication (64 × 128 dots matrix) (measurement value, measurement mode, operating conditions, remaining battery level, data memory, bar indication for sensor output and communication channel etc.)
Measurement Mode	Monitoring mode/Batch mode
Indicated Value	Level indication: 0-2000 (In case of zero-based setting at the 2nd dot from the left in the sensor output bar graph)
External Output	Analog output: DC0-200 mV.
	Digital input/output: RS-232C output the indicated value (ASCII Code)
Operating Temperature & Humidity	0 to 40°C 10 to 80 %RH
Dimensions	W84 × H275 × D40 mm
Weight	Approx. 640 g
Power Source	4 × AA alkaline batteries or AC adaptor, Approx. 8 hours
Accessories	Tube intake, AC adaptor, Output connector, Communication pack (CD), 4 × AA Alkaline batteries, Teflon tube (1 m), 2 × Activated carbons, 2 × Filter elements (10 pcs.)

REAL-TIME VOC MONITOR
XP-3120-V

VOC

Features
- Able to monitor concentration changes with data-logging function
- VOCs can be detectable and portable

Specifications

Model	XP-3120-V
Target Gas	VOC (Calibration Gas: Toluene)
Sensor Type	Hot-wire semiconductor
Sampring method	Internal Pump
Detection Range	Low 0 to 100 ppm/High 0 to 1000 ppm
Power Source	4 × AA batteries, Approx 25 hours
Operating Temperature	0 to 40°C
Approvals	Ex ib d IIB T3 (TIIS)
Dimensions	W82 × H162 × D36 mm
Weight	Approx. 450 g
Accessories	4 × AA Alkaline batteries, Replacement filter
Options	Datalogger kit (CD-ROM + USB cable), AC adaptor, Activated carbon filter set

Measurement Range (Reference Value)

Gas Type	Controlled Concentration (ppm)	Lower mesurement Range (ppm)	Upper mesurement Range (ppm)
toluenes	20	3	1000
o-xylene	50	1.1	378
m-xylene	500	1.5	487
p-xylene	50	1.4	463
ethyl acetate	200	0.2	82
n-butyl acetate	150	0.3	96
methanol	200	0.3	100
methyl isobutyl ketone	20	0.2	54
isopropyl alcohol	200	0.2	67
methyl ethyl ketone	200	0.2	50
1-butanol	25	0.2	60
isobutyl alcohol	50	0.2	62
acetone	500	0.2	52
Ethylene glycol mono -n-butyl ether (buthyl cellsolve)	25	0.6	191
isobutyl acetate	150	0.4	149
cyclohexanone	20	0.2	56
n-hexane	40	8.8	2941
dichloromethane	50	15	5000
methyl acetate	200	0.3	109

VOC MONITOR
XV-389

VOC

Features
- Select a target from 17 chemical substances
- Alarm levels (TWA, STEL) can be set for selected substances
- Direct reading, average, TWA and STEL values of periodical concentrations

Specifications

Model	XV-389		
Target gas	17 types of VOC (Calibration gas: Toluene)		
Sensor Type	Hot-wire semiconductor		
Detection Range	0 to 500 ppm		
Display Resolution	1 ppm		
Alarm Set Value	TWA Alarm	Exposure limit of eight-hours	Depends on gas type
	STEL Alarm	Exposure limit of short time (15 minutes)	
Power Source	1 x AAA alkaline dry battery, Approx. 30 hours		
Operating Temperature & Humidity	-10 to 40°C, 30 to 85 %RH		
Approvals	IP52		
Dimensions	W94 × H40 × D20 mm		
Weight	Approx. 73 g		
Accessories	1 × AAA alkaline battery, 1 × Safety pin adaptor, Sensor cover with filter		

Target Gas and Alarm Set Value

Gas No.	Target Gas	TWA(ppm)	STEL(ppm)
1	toluene	20	60
2	xylene	50	150
3	ethyl acetate	200	–
4	n-butyl acetate	50	150
5	methanol	200	250
6	methyl isobutyl ketone	20	75
7	isopropyl alcohol	200	400
8	methyl ethyl ketone	200	300
9	1-butanol	20	60
10	isobutyl alcohol	50	150
11	acetone	200	500
12	butyl cellosolve	20	60
13	isobutyl acetate	50	150
14	cyclohexanone	20	50
15	n-hexane	40	120
16	dichloromethane	50	150
17	methyl acetate	200	250

STEEL DUST METER
SDM-72/SDM-73

Steel Dust Concentration

SDM-72

SDM-73

Features
- **Simple diagnosis of the wear condition of bearings, gears and cylinders**
- **Monitoring steel dust contamination in hydraulic oil and grinding oil**
- **Pre-diagnosis for Ferrography method and SOAP method**

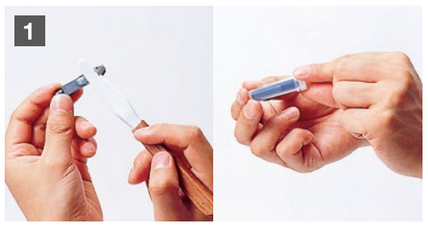
Specifications

Model	SDM-72	SMD-73
Measurement Principle	Magnetic balance type electromagnetic method	Magnetic balance type electromagnetic induction method
Substance Measured	Steel dust concentration in grease	Steel dust concentration in lubricating oil
Measurement Range	0 to 5.000 %Wt	0 to 19999 wt ppm
Minimum Resolusion	0.001 %Wt	1 wt ppm
Amount of sample	Approx. 0.8 ml	1.5 ml
Power Source	4 × AA Alkaline battries, Approx. 30 hours	
Approvals	CE	
Operating temperature	0 to 40°C	
Dimensions	W84 × H190 × D40 mm	
Weight	Approx. 500 g	
Accessories	Carrying case, Grease sampling spatula, Grease sample case (10 pieces) and 4 × AA Alkaline battries	Carrying case, 2 ml syringe (5 pieces), Oil sampling nozzle (2 pieces), Syringe holder and 4 × AA Alkaline battries

Usage Instructions

For maintenance of rotating machinery using grease as a lubrication oil

Grease Steel Dust Meter SDM-72



Take a grease sample with the spatula, wipe it in the sample case, and wipe off the excess.

Insert the grease sample into the “SAMPLE” port.

The unit measures and displays the steel dust density automatically.

For maintenance of rotating machinery using oil as a lubrication oil

Oil Steel Dust Checker SDM-73

Collect oil sample into the sampling bottle and shake well. Collect oil sample in syringe with oil collection nozzle.

Shake the syringe well and attach syringe holder.

Insert the sampling oil into the sample port immediately. The unit measures and displays the steel dust density automatically.

FORMALDEHYDE DETECTOR
XP-308B

Indoor Air Pollutant

Features
- **Changable mg/m³ and ppm as measurement unit**
- **Max. 32 cases of measuring result can be memorized**
- **Reduce VOCs with DNPH filter**

Specifications

Model	XP-308B
Target Gas	Formaldehyde
Sensor Type	Electrochemical
Detection Range (Reference Indication)	0.01 to 0.38 mg/m³ (0.39 to 3.00 mg/m³) 0.01 to 0.30 ppm (0.31 to 3.00 ppm)
Sampling Method	Internal Pump
Measurement Time	30 min/10 min measurement mode (selectable)
Power Source	6 × C batteries or AC adaptor (9 VDC)
Battery Life	30-min mode: Up to 50 times (10-min mode: Up to 100 times)
Filter Life	30-min mode: 50 times (10-min mode: 100 times)
Operating Temperature	5 to 40°C
Dimensions	W175 × H140 × D86 mm
Weight	Approx. 2.5 kg
Accessories	3 × DNPH Filters, 6 × C batteries, Sampling tube, 10 × filter elements, Tweezers
Options	AC adaptor, External output cable, Data reception software

Classification of Explosive Gases and Explosion Protection

Classification of Explosive Gases

Classification as per the Japanese Standards

•Explosion Classes and Ignition Groups of Typical Explosive Gases

Explosion Class \ Ignition Group	G1	G2	G3	G4	G5
1	Acetone Ammonia Carbon monoxide Ethane Acetic acid Toluene Benzene Methane	Ethanol Isopentyl acetate 1-Butanol Butane Acetic anhydride Ethyl acetate Propane Methanol	Gasoline Hexane	Acetaldehyde Ethyl ether	
2	Coal gas	Ethylene Ethylene oxide			
3	Water gas Hydrogen	Acetylene			Carbon disulfide

•Explosion Classes

Class	Minimum gap with 25 mm-length path which permits the flame propagation (mm)
1	> 0.6
2	0.4 < gap ≤ 0.6
3	≤ 0.4

* Explosion is categorized into three classes according to the minimum gap to allow for flame propagation, determined by using a standard container for explosion gas.

•Ignition Groups

Group	Ignition Temperature (°C)
G1	> 450
G2	≤ 450
G3	≤ 300
G4	≤ 200
G5	≤ 135

* Ignition is categorized into five groups according to the ignition temperature of explosive gases.

Classification as per the IEC Standards

•Equipment Groups and Temperature Classes of Typical Explosive Gases

Equipment Group \ Temperature Class	T1	T2	T3	T4	T5	T6
IIA	Acetone Ammonia Ethyl acetate Toluene Benzene Methane Ethane Acetic acid Isobutane	1-Butanol Propane Methanol Acetic anhydride	n-Hexane	Acetaldehyde		
IIB	Carbon monoxide	Ethanol Ethylene Ethylene oxide		Ethyl ether		
IIC	Hydrogen	Acetylene				Carbon disulfide

•Equipment Groups

Flameproof Enclosure

Group	Maximum Experimental Safe Gap (mm)
IIA	≥ 0.9
IIB	< 0.9
IIC	≤ 0.5

Intrinsic Safety

Group	Minimum Ignition Current (MIC) Ratio
IIA	> 0.8
IIB	0.45 ≤ MIC ≤ 0.8
IIC	< 0.45

•Temperature Classes

Class	Surface Temperature (°C)
T1	≤ 450
T2	≤ 300
T3	≤ 200
T4	≤ 135
T5	≤ 100
T6	≤ 85

* Source: ISO/IEC 80079-20-1:2017

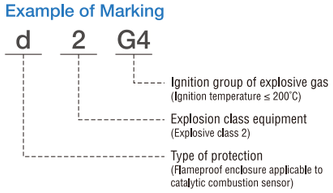
Classification of Explosion Protection

Symbols as per the Japanese Standards

Item	Symbol	Description
Type of protection	d	Flameproof enclosure
	o	Oil immersion
	f	Pressurization
	e	Increased safety
	ia, ib	Intrinsic safety
	s	Special measures
Gas Group	1	Applicable to explosion class 1 gases/vapors
	2	Applicable to explosion classes 1&2 gases/vapors
	3a	Applicable to explosion classes 1&2 gases/vapors + water gas + H_2
	3b	Applicable to explosion classes 1&2 gases/vapors + CS_2
	3c	Applicable to explosion classes 1&2 gases/vapors + C_2H_2
	3n	Applicable to all gases
Ignition Group of Explosive Gas	G1	Ignition temperature > 450°C
	G2	Ignition temperature ≤ 450°C
	G3	Ignition temperature ≤ 300°C
	G4	Ignition temperature ≤ 200°C
	G5	Ignition temperature ≤ 135°C

* Only Intrinsically safe equipment can be used in Zone 0.

Example of Marking

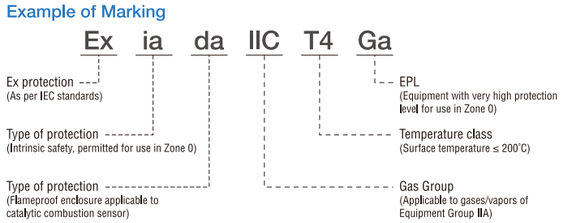


Symbols as per the IEC Standards

Item	Symbol	Description
Ex Protection	Ex	Explosion-proof structure in conformity to the IEC-harmonized standards
Type of Protection	da	Flameproof enclosure
	db	Flameproof enclosure
	dc	Flameproof enclosure
	pv	Pressurization
	pxb	Pressurization
	pyb	Pressurization
	pzc	Pressurization
	eb	Increased safety
	ec	Increased safety
	ob	Oil immersion
	oc	Oil immersion
	ia	Intrinsic safety
	ib	Intrinsic safety
	ic	Intrinsic safety
Gas Group	II	For industrial applications
	IIA	Applicable to gases/vapors of Equipment Group IIA
	IIB	Applicable to gases/vapors of Equipment Group IIB
	IIC	Applicable to gases/vapors of Equipment Group IIC
Temperature Class	T1	Surface temperature ≤ 450°C
	T2	Surface temperature ≤ 300°C
	T3	Surface temperature ≤ 200°C
	T4	Surface temperature ≤ 135°C
	T5	Surface temperature ≤ 100°C
	T6	Surface temperature ≤ 85°C
Equipment Protection Level (EPL)	Ga	Equipment with very high protection level for use in Zone 0
	Gb	Equipment with high protection level for use in Zone 1
	Gc	Equipment with enhanced protection level for use in Zone 2

* Source: IEC 60079-0:2017

Example of Marking



* Source: IEC 60079-0:2017

Danger of Combustible and Toxic Gases and Vapors

Gas/Vapor	Chemical Formula	Flammable Range (vol%)	Explosion Class	Ignition Group	Flash Point (°C)	TLV (ppm)	Specific Gravity of Gas (air=1)
Hydrogen	H_2	4.0 – 75.0	3	G1	(gas)	—	0.07
Methane	CH_4	5.0 – 15.0	1	G1	(gas)	—	0.55
Propane	C_3H_8	2.1 – 9.5	1	G2	(gas)	—	1.60 I
n-Butane	C_4H_{10}	1.6 – 8.5	1	G2	(gas)	—	2.05
Isobutane	C_4H_{10}	1.8 – 8.4 I	*1	*1	(gas)	—	2.00 I
n-Pentane	C_5H_{12}	1.5 – 12.5	1	G3	< -40	1,000	2.49
Ethylene	C_2H_4	2.7 – 36	2	G2	(gas)	200	0.98 I
Propylene	C_3H_6	2.0 – 11.0	1	G1	(gas)	500	1.49
Butylene (cis-2-Butene)	C_4H_8	1.7 – 9.0 I	*1	*1	(gas)	—	1.9 I
Acetylene	C_2H_2	1.5 – 100	3	G2	(gas)	—	0.90
Toluene	$C_6H_5CH_3$	1.2 – 7.1	1	G1	4	20	3.18
o-Xylene	$C_6H_4(CH_3)_2$	1.0 – 6.0	1	G1	32	100	3.66
Methanol	CH_3OH	6.0 – 36	1	G2	11	200	1.10
Ethanol	C_2H_5OH	3.3 – 19	1	G2	13	(STEL1,000)	1.59
Acetone	$(CH_3)_2CO$	2.1 – 13	1	G1	-20	250	2.00
Methyl ethyl ketone	$CH_3COC_2H_5$	1.8 – 11.5	1	G2	-9	200	2.48
Ethyl acetate	$CH_3COOC_2H_5$	2.0 – 11.5	1	G2	-4	400	3.04
Butyl acetate	$CH_3COO(CH_3)_2CH_3$	1.7 – 7.6	1	G2	22	50	4.01
Town gas (methane)	—	As per Methane	*1	*1	(gas)	—	0.55
LPG (Isobutane)	—	As per Isobutane	*1	*1	(gas)	—	2.0 I
Gasoline	—	1.0 – 7.0	1	G3	< -20	300	3~4
Kerosene	—	0.7 – 5 I	1	G3	37–65	200mg/m³	4.5 I
n-Hexane	$CH_3(CH_2)_4CH_3$	1.1 – 7.5	1	G3	-22	50	2.79
Butadiene	CH_2=$CHCH$=CH_2	2.0 – 12	2	G2	(gas)	2	1.87
Acetaldehyde	CH_3CHO	4.0 – 60	1	G4	-39	(C25)	1.52
Polyvinyl chloride	CH_2=$CHCl$	3.6 – 23	1	*1	(gas)	1	2.16
Carbon monoxide	CO	12.5 – 74	1	G1	(gas)	25	0.97
Ammonia	NH_3	15.0 – 28	1	G1	(gas)	25	0.60 I
Hydrogen sulfide	H_2S	4.0 – 44	2	G3	(gas)	1(10*2)	1.19
Chlorine	Cl_2	— —	—	—	—	0.1	2.5 I
Sulfur dioxide	SO_2	— —	—	—	—	(STEL0.25)	2.25 I
Benzene	C_6H_6	1.3 – 7.1	1	G1	-11	0.5	2.70
Acrylonitrile	CH_2=$CHCN$	3.0 – 17	1	G1	0	2	1.83
Methyl bromide	CH_3Br	10.0 – 16.0 I	*1	*1	—	1	3.3 I
Ethylene oxide	CH_2CH_2O	3.6 – 100	2	G2	(gas)	1	1.52
Hydrogen cyanide	HCN	5.6 – 40	1	G1	-18	(C4.7)	0.93
Phosgene	$COCl_2$	— —	—	—	—	0.1	3.4 I
Hydrogen chloride	HCl	— —	—	—	—	(C2)	1.3 I
Arsine	AsH_3	4.5 – 78 I	—	—	—	0.005	2.70 I
Phosphine	PH_3	1.8 – I	—	—	—	0.05	1.17 I
Silane	SiH_4	1.37 – 100 I	—	—	—	5	1.3 I
Diborane	B_2H_6	0.8 – 88 I	—	—	—	0.1	0.96 I
Germane	GeH_4	— —	—	—	—	0.2	2.65 I
Dichlorosilane	SiH_2Cl_2	4.1 – 99 I	—	—	—	—	3.48 I
Hydrogen selenide	H_2Se	— —	—	—	—	0.05	2.8 I
Fluorine	F_2	— —	—	—	—	0.1	1.3 I
Nitrogen dioxide	NO_2	— —	—	—	—	0.2	1.58 I
Chlorine trifluoride	ClF_3	— —	—	—	—	(C0.1)	3.18 I
Hydrogen fluoride	HF	— —	—	—	—	0.5	0.7 I
Hydrogen bromide	HBr	— —	—	—	—	(C2)	2.8 I

NOTE
· The flammable range, explosion class, ignition group, flash point and specific gravity are derived from the Recommended Practices for Explosion-Protected Electrical Installation in General Industries issued by the National Institute of Industrial Safety (TIIS) on March 31, 2006. The entries marked with "I" are derived from the International Chemical Safety Cards (ICSCs).
· The TLVs are the ones released by ACGIH in 2020. There are three types of TLVs, TWA, STEL and Ceiling. The values of STEL and Ceiling are noted in brackets with "STEL" or "C".
*1. Not provided in the Recommended Practices for Explosion-Protected Electrical Installation in General Industries.
*2. When in the oxygen deficiency state as per Article 2 (2) in the Ordinance on Prevention of Anoxia, etc. (a state under which the oxygen concentration in the air is less than 18%, or in which the concentration of hydrogen sulfide in the air is 10ppm or more).

Flammable Range (Explosive Range)

When mixed with air or oxygen, a combustible gas within a specific concentration range will generate an explosion on contact with an ignition source. This range is called explosive range. The lowest concentration of the range is the Lower Explosive Limit (LEL) and the highest is the Upper Explosive Limit (UEL).

Threshold Limit Value (TLV)

TLVs refer to airborne concentrations of chemical substances (e.g., toxic gas) and represent occupational exposure limits under which workers may work repeatedly for 8 hours a day, day after day, without adverse health effects. Established as guidelines by the American Conference of Governmental Industrial Hygienists (ACGIH) and Japan Society for Occupational Health.