

Semiconductor Gas Detector XPS-7II

Instruction Manual

- Keep this manual for easy reference.
- Carefully read this manual prior to use.



NEW COSMOS ELECTRIC CO., LTD.

Instruction Manual No.
XPS-7IIET (01)

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1 Introduction

Thank you for purchasing the New Cosmos XPS-7II extractive-type portable semiconductor gas detector. To ensure safe and reliable operation, please read this instruction manual prior to use.




This product is intended for use in a semiconductor-manufacturing plant for the early detection of a gas leak. It can detect various semiconductor manufacturing gases just by switching the sensor unit.

This unit measures the gas concentration and simultaneously displays the measurement on its display. If the gas concentration level reaches a preset level, the unit will produce audio-visual alarms.

Carefully read this manual regardless of your experience with gas detectors. Do not use the product for other than the intended purpose or in a manner not described in this manual.

Symbols Used in this Manual

This manual uses Danger, Warning, Caution and Note symbols to draw attention to procedures, materials, methods, and processes, which require particular attention.

 DANGER	Indicates an imminently hazardous situation that can result in death or serious injury.
 WARNING	Indicates a potentially hazardous situation that may result in death or serious injury.
 CAUTION	Indicates a hazardous situation that may result in minor injury or property damage.
NOTE	Provides advice/information on product handling.

Safety Precautions

Follow the precautions below to ensure safe operation:



WARNING

- This product is not explosion-proof and should not be installed in a hazardous area.



CAUTION

- This product is not drip-proof and should be kept away from water.
- Avoid strong mechanical shock, impact or vibration to the product, e.g., dropping or bumping. Failure to do so may impair its performance.
- Turn on the detector in clean air. Normal gas detection is not possible, and product's performance may be compromised if turned on in an atmosphere that may contain target or interfering gases.
- The service life of the sensor unit is six months. Before use, check that the sensor unit expiration date has not been reached. Use of expired sensor may cause inaccurate detection.
- Carry and use the detector with its face (LCD) facing upward to keep the sensor vertical.

Follow the precautions below for storage of the product:



WARNING

- Do not leave the product in high temperature and humidity conditions for a long period of time. Doing so may compromise its performance.



CAUTION

- Avoid rapid change in temperature/humidity. Failure to do so may compromise the product's performance.
- If this product is to be unused or stored for an extended period of time, the batteries should be removed.

2 Package Contents

A standard package consists of following items. If any items are missing or damaged, please contact New Cosmos or its authorized representative for replacement.

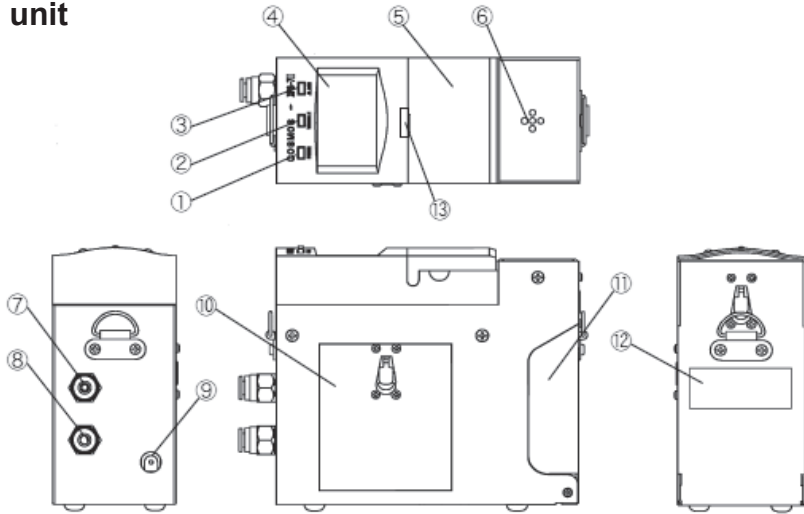
Item	Qty.
Gas detector	1
Shoulder strap	1
Gas sampling tube	1
Replacement filter element	2
Alkaline AA battery	4
Instruction manual (this document)	1
Inspection certificate	1

3 Sensor Unit Variations

Model	Target gas		F.S.	Alarm set value	
				1 st stage	2 nd stage
XDS-7NH	NH ₃	Ammonia	100ppm	12ppm	25ppm
XDS-7SH	SiH ₄	Silane	25ppm	2.5ppm	5ppm
XDS-7DC	SiH ₂ Cl ₂	Dichlorosilane	25ppm	2.5ppm	5ppm
XDS-7AH	AsH ₃	Arsine	250ppb	25ppb	50ppb
XDS-7PH	PH ₃	Phosphine	1ppm	0.15ppm	0.3ppm
XDS-7BH	B ₂ H ₆	Diborane	500ppb	50ppb	100ppb
XDS-7SE	H ₂ Se	Hydrogen selenide	250ppb	25ppb	50ppb
XDS7GH	GeH ₄	Germane	1ppm	0.1ppm	0.2ppm
XDS-7CL	Cl ₂	Chlorine	5ppm	0.25ppm	0.5ppm
XDS-7CF	ClF ₃	Chlorine trifluoride	1ppm	0.05ppm	0.1ppm
XDS-7HC	HCl	Hydrogen chloride	25ppm	2.5ppm	5ppm
XDS-7HF	HF	Hydrogen fluoride	10ppm	1.5ppm	3ppm
XDS-7HB	HBr	Hydrogen bromide	10ppm	1.5ppm	3ppm
XDS-7NO	NO	Nitrogen monoxide	100ppm	12ppm	25ppm
XDS-7HS	H ₂ S	Hydrogen sulfide	50ppm	5ppm	10ppm
XDS-7CO	CO	Carbon monoxide	250ppm	12.5ppm	25ppm
XDS-7DS	Si ₂ H ₆	Disilane	25ppm	2.5ppm	5ppm
XDS-7F2	F ₂	Fluorine	5ppm	0.5ppm	1ppm
XDS-7OZ	O ₃	Ozone	1ppm	0.05ppm	0.1ppm
XDS-7NF	NF ₃	Nitrogen trifluoride	100ppm	5ppm	10ppm

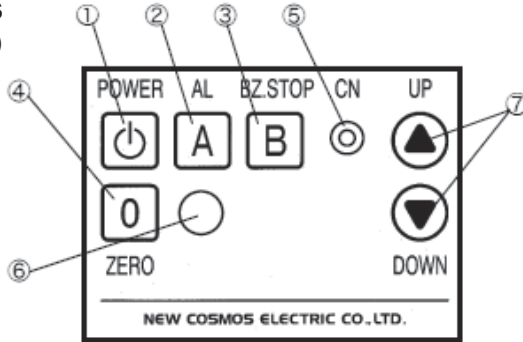
4 Unit Components

Main unit



Item	Component name	Description/Function
1	Green POWER LED	Lit while in normal operation mode (gas-monitoring mode) and flashes while in warm-up cycle
2	Amber TROUBLE LED	Flashing indicates an internal failure is present
3	Red ALARM LED	When the gas concentration level exceeds the 1 st stage alarm set value, the ALARM LED starts flashing, and when it exceeds the 2 nd stage alarm set value, the ALARM LED flashes faster
4	LCD	Displays alarm notification, numeric gas concentration value, gas concentration on bar graph, sensor fault status, flow rate status, and battery level
5	Front cover	Pull by holding it by the sides, then slide down to access the operation buttons
6	Audio opening	Open for audio
7	Gas inlet port	Connects to the gas sampling tube. Outside dia.6mm
8	Gas outlet port	Discharges sampled gas. Outside dia.6mm
9	Adapter connector	Connects to a dedicated 100-240VAC/6VDC adapter
10	Battery cover	Cover for battery compartment
11	Sensor cover	Open for sensor unit installation
12	Sensor window	Check the sensor unit inside thru this window
13	Red battery LED (behind the front cover)	Lights up when batteries are installed and the brightness increases when the battery is close to empty. Lights up when the cover is open while the detector is off

Operation buttons (behind the front cover)



Item	Component name	Description/Function
1	POWER button	Press and hold to turn on/off the detector
2	AL button (to check the alarm set values)	Each press cycles through "1 st stage alarm set value", "2 nd stage alarm set value", and current gas concentration value on the LCD
3	BZ.STOP button	Press to mute the alarm audio
4	ZERO button	Press and hold to perform a zero adjustment
5	CN connector	Connects to the CA-7 communication adapter (sold separately) to collect logging data
6	Logger button	Used for data logging
7	▲(UP) and ▼(DOWN) buttons	Used for settings (e.g., log starting time entry)

LCD

Flow rate low icon
Lights up when flow rate is low

1st and 2nd stage gas alarm icons
Lights up when the gas level reaches preset alarm value

Sensor fault icon
Lit when a sensor fault is detected

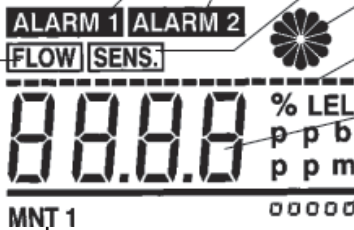
Flow rate icon
Spins during normal operation and stops when flow rate is low

Gas concentration on bar graph
One bar represents 5% of the full scale value. The bar graph value increases from left to right with the far right being full scale value

Numeric gas concentration

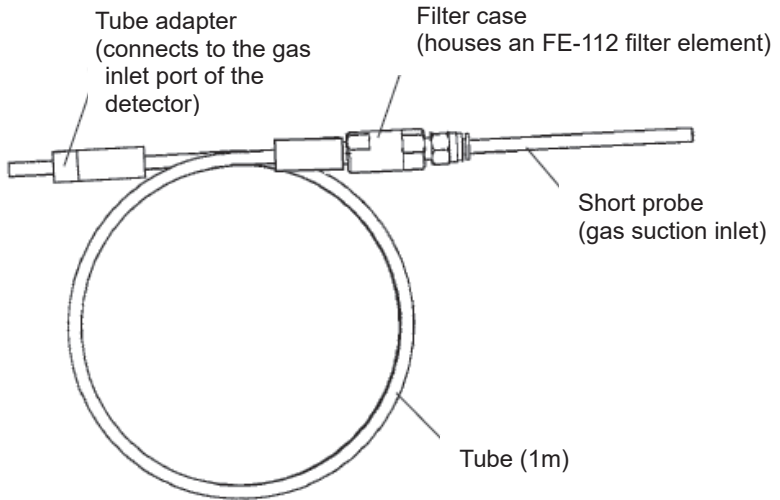
Battery level indicator

○○○○○ Full
 ○○○○
 ○○○
 ○○○
 ○○
 ○ Empty (flashing)



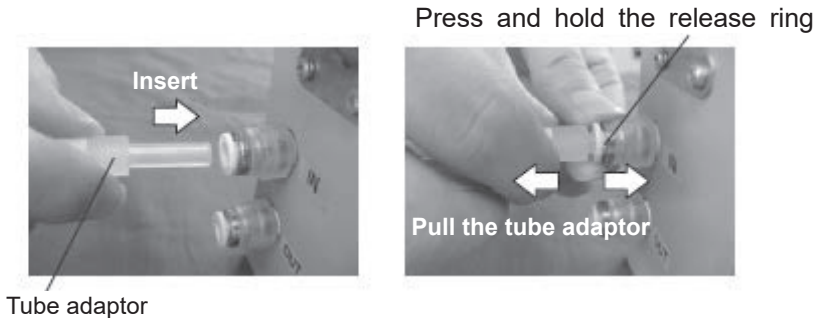
Logging icon
Lit when data logging is in progress.

Gas sampling tube



Installation: Push and insert the tube adapter of the gas sampling tube into the detector's gas inlet port. The tube adapter is automatically locked and sealed to the port when inserted. Ensure that it is securely connected by pulling it slightly.

Removal: Press and hold the release ring to unlock the tube adapter. While holding the release ring, pull out and remove the tube adapter from the detector's gas inlet port.



5 Operation

Perform a routine check (page 12) before use. Normal gas detection may not be possible without check, which will then fail gas leak detection.

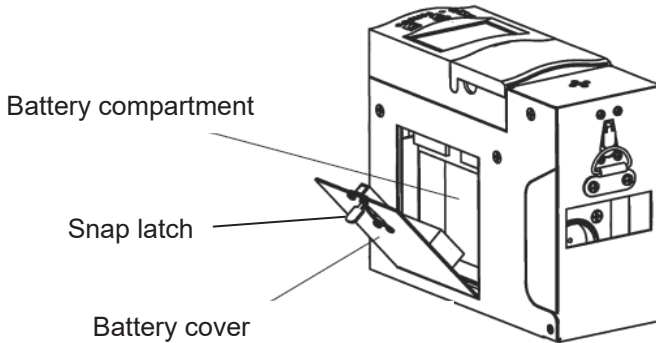


CAUTION

- Turn on the detector in clean air. Normal gas detection is not possible, and product's performance may be compromised if turned on in an atmosphere that may contain target or interfering gases.
- Carry and use the detector with its face (LCD) facing upward to keep the sensor vertical.

5-1. Battery Installation

- (1) Lift and unlock the snap latch on the battery cover. Pull the cover forward. The cover is now removable.
- (2) Install the four alkaline AA batteries (provided) into the battery compartment. Correctly install by referring to the polarity marking inside the compartment.
- (3) Reinstall the battery cover and lock the snap latch.



WARNING

- Only use new batteries of the same brand and type for replacement.
- Replace all the four batteries at the same time.



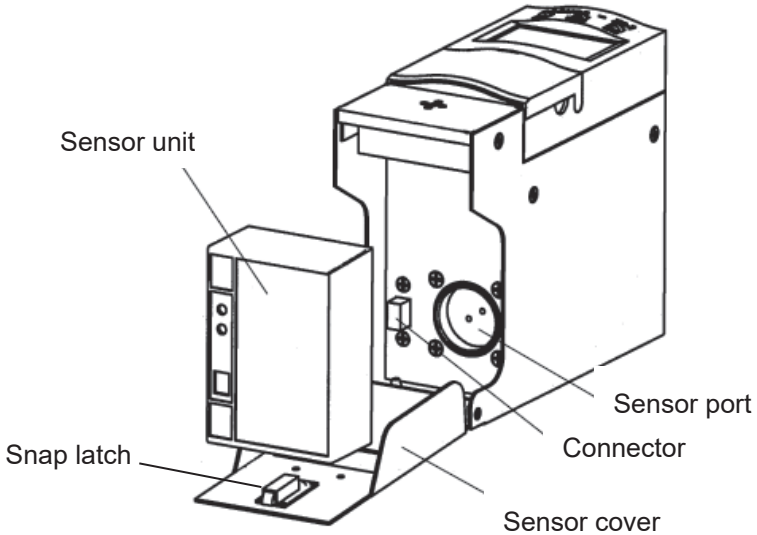
CAUTION

Replace the batteries when

- (a) only one square (battery level indicator, page 5) is left flashing, indicating empty battery, while the unit is on,
- (b) pressing the POWER button does not turn on the unit, or
- (c) the red battery LED's brightness increases, indicating empty battery like (a) above, while the unit is off.

5-2. Sensor Unit Installation

- (1) Lift and unlock the snap latch on the sensor cover. Pull the cover forward. The cover is now open (this cover cannot be detached from the unit).
- (2) Install a sensor unit in the detector by engaging with the connector and sensor port on the detector.
- (3) Reinstall the sensor cover and lock the snap latch.



CAUTION

- Normal gas detection is not possible, if the sensor unit is not securely connected to the detector, causing poor airtightness.
- Energize sensor units with an EC-7 sensor stocker (sold separately) before use. Normal gas detection is not possible if the sensor units are not sufficiently energized. Insufficient energization may cause a sensor fault alarm. Also, a sensor unit is being energized while installed in the detector even though the detector is off, as long as the battery remains or power is supplied.
- Before regular sensor unit replacement, fully energize a new sensor unit (e.g., ex-factory unit) by installing it in an EC-7 sensor stocker (sold separately) or this detector.
- Only use XDS-7 series sensor unit for this detector. Others (e.g., CDS-7, COS-7, CHS-7) cannot be used.

5-3. Power on

- (1) Press and hold the POWER button. The unit gives off a long beep. Then the green POWER LED starts flashing. The warm-up cycle (30-second self-test followed by automatic zero adjustment) starts.
- (2) When the warm-up cycle is completed, the flashing POWER LED becomes steady, indicating that the unit is ready for detection.



CAUTION

- Zero adjustment (zeroing) is performed automatically when the detector is turned on. Turn on the detector in clean air to prevent incorrect zero adjustment. Incorrect zero adjustment will cause inaccurate detection.
- After turning off the detector, leave it for more than one second before turning it on again.

5-4. Detection

Put the short probe to the suspected leak point. When a gas leak is detected, the gas concentration value will be displayed on the LCD. If the gas concentration level exceeds the preset level, the red ALARM LED starts flashing and the detector starts beeping as shown in the table below.

Gas concentration exceeds	Red ALARM LED	Audio alarm
1 st stage alarm set value	Flashes	Beeps
2 nd stage alarm set value	Flashes fast	Beeps fast
F.S. value	Flashes faster	Steady tone



CAUTION

- Avoid liquid seepage (e.g., water). Liquid entering the gas sampling tube or gas detector will impair proper gas detection, leading to a product failure.
- If the zero point drifts due to exposure to high concentration gas, etc., power cycle the detector or press and hold the ZERO button to perform a zero adjustment. Ensure that the zero adjustment is done in clean air.

5-5. Power off

Before turning off the detector, ensure that the reading shows zero in clean air by running the detector in clean air. Press and hold the POWER button to turn off the detector.



CAUTION

- After detection of adsorptive gas (e.g., HF and F₂), replace the filter element (FE-112) with a new one. Correct detection is not possible if the filter element is dirty.

6 Data Logging

The detector can log up to 22 hours of the measurement data. The log data can also be transferred to a pc by using data logger kit (sold separately, see 10. Consumable and Optional Parts on page 13).

NOTE

- Once data logging starts, the peak concentration value every 10 seconds will be logged.
- The oldest events will be deleted to make room for the newest when the unit runs out of room for new ones.
- Data logging automatically stops when the detector is turned off.
- Logging date cannot be entered.
- Refer to the XPS7L data logger software's instruction manual (separate document) for the procedure to transfer log data to a pc.



- (1) During normal operation, press the ▼ button. “LoG” appears on the LCD. The log starting time entry screen appears.



- (2) Press the logger button. One of the four digits flashes at one time. Enter the value for the flashing digit with the ▲ and ▼ buttons. Repeat this step four times to enter the four digits (log starting time).



For example, when you want to record that the starting time is 1:20 pm, enter “13.20”.



- (3) Press and hold the ZERO button to start logging. The logging starts. “MNT1” appears while logging is in progress.



- (4) To end the logging, press the BZ.STOP button. “MNT1” disappears and the logging ends.

NOTE

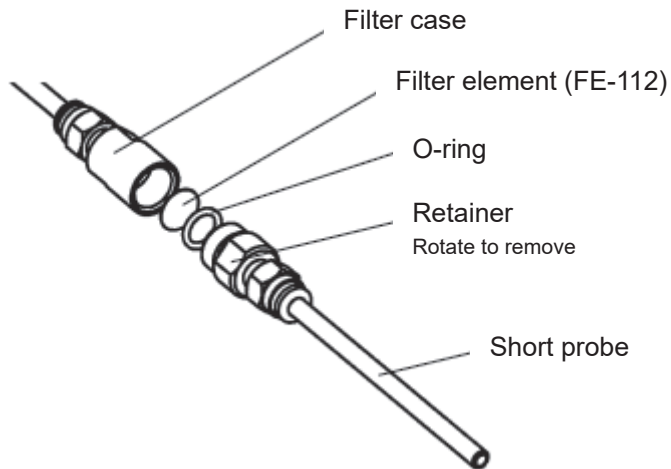
Press the ▲ or ▼ button few times during normal operation, the following values will be displayed on the right bottom corner of the LCD. They are just the ex-factory parameters and not for customer use.

25	0	EG	40	F	PH3	P _r	80	P	200
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7 Filter Element Replacement

Replace the filter element with a new one, if it is dirty or wet.

- (1) Turn the retainer and short probe as a whole counterclockwise to remove them from the filter case.
- (2) Remove the O-ring from the filter case.
- (3) Replace the filter element with a new one.
- (4) Reinstall the O-ring back onto the case.
- (5) Reinstall the retainer and short probe to the filter case.



8 Maintenance

Routine Check (pre-use check)

Perform a routine check before each use.

- Check the tube of the gas sampling tube for damage or wear. If any, replace with a new one.
- Check the filter element in the filter case. Replace it with a new one if dirty or discolored.

Annual Inspection

- Contact New Cosmos or your New Cosmos representative to perform an annual inspection. Perform it at least once a year to maintain the product accuracy.
- The sensor unit replacement cycle is six months.

Important Notice for Annual Inspection

This product is a precision instrument. It is vital to perform periodical inspections to maintain the detector's performance and ensure safety. It is highly recommended that a maintenance contract with a local New Cosmos representative be made for the performance of scheduled annual inspections (once a year at least).

Cleaning

Clean the exterior with a soft, damp cloth.

9 Troubleshooting

Before contacting us for service repair, perform basic troubleshooting using the table below. If the detector locks up (cannot be turned off), remove all batteries. After a few minutes, put the batteries back in and turn on the detector.

Symptom	Cause	Action	Reference
Pressing POWER button does not turn on the power	Battery orientation incorrect	Remove batteries and reinsert them in the correct orientation	5-1. Batteries Installation (page 7)
	Battery depleted	Replace batteries with new ones	
	No sensor unit installed	Install sensor unit	5-2. Sensor Unit Installation (page 8)
Flow rate low	Filter clogged	Replace filter element with a new one	7. Filter Element Replacement (page 11)
Sensor fault	Sensor insufficiently energized	Fully energize sensor unit, then reinstall	5-2. Sensor Unit Installation (page 8)
	Sensor unit expired	Replace sensor unit with a new one	

10 Consumable and Optional parts

Part Name	Model	Remarks
Sensor unit	(XDS-7 series)	Sensor cartridge. Contact Cosmos or your New Cosmos representative for model selection
Filter element (x 10 pcs)	FE-112	Install in the filter case
100-240VAC/6VDC adapter *		Dedicated AC power adapter when using 100-240VAC
Sensor stocker	EC-7	Can energize up to six sensor units at one time
Data logger software *	XPS7L	Required to transfer log data to a pc
Communication adapter *	CA-7	
Serial cross cable *	KRS-L09-2K	

* Does not comply with CE marking.

11 Warranty

The warranty period is one (1) year from the date of purchase.

You are entitled to the limited warranty, if the product malfunctions due to a manufacturing defect during normal use in accordance with the instruction manual, specifications and labels.

Warranty Scope

If the product fails or is found to be damaged due to a manufacturing defect during the warranty period, and used in accordance with the instruction manual and specifications, we will provide a free replacement and repair service. This warranty covers the New Cosmos product/parts only and not third-party product/parts.

Warranty Exclusions

The following will be repaired at the cost of customer even during the warranty period.

- (1) Failures and damages incurred by incorrect use, deliberate acts or negligence of the user.
- (2) Failures and damages caused by disaster, earthquake, storm and flood, lightning, extreme climate, abnormal power supply voltage, excessive electromagnetic interferences, or other acts of God.
- (3) Failures and damages resulting from repair and/or modification by non-New Cosmos certified technicians.
- (4) Consumables and failures and damages resulting from improper consumable replacement.
- (5) Other failures and damages not attributable to the manufacturer.

12 Specifications

Target gas	Semiconductor manufacturing gases
Detection principle	Electrochemical sensor Electrochemical + pyrolyzer sensor
Gas sampling method	Extractive type (pump)
Detection range	As per delivery specifications
Gas concentration display	Four-digit on LCD
Indication accuracy *1	±10%F.S. except for XDS-7NF -30%F.S. to +10%F.S. for XDS-7NF
Response time *1	T60: Less than 60 seconds
Power supply	Alkaline AA battery x 4pcs or Dedicated 100-240VAC/6VDC adapter *3
Continuous operating time*2	More than 12 hours except for XDS-7NF More than 8 hours for XDS-7NF (by alkaline AA batteries (Toshiba LR6AN) at 20°C, with no gas alarm)
Operating temperature and humidity	0 to +40°C, 30 to 85%RH No condensation. No rapid change in temperature/humidity
Dimensions	Approx. W62 × H150 × D128 mm (excluding protrusions)
Mass	Approx. 1.3 kg
Compliance	CE (EMC: 2014/30/EU) *3 *4

*1. Under identical conditions.

*2. The operating time (battery life) may vary depending on environment and conditions of use, storage period, battery manufacturer etc.

*3. AC power adapter, data logger software, communication adapter, and serial cross cable (page 13) do not comply with CE marking.

*4. There are two types of EC-7 sensor stocker, global and domestic (for use in Japan). Global type is CE-marked.

Additional copies of this instruction manual may be purchased.
Contact New Cosmos or its authorized representative for ordering.
The contents of this manual are subject to change without notice.

Authorized representative:

Manufacturer:

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