SI-100C
Fixed Gas Detector

Description

SI-100C is a fixed gas detector installing in a place where potential gas hazard exists to measure oxygen, toxic gas and combustible gas without LCD display. It can be connected to the controller with a standard 4-20mA analog outputs.

Key Feature

- Explosive proof structure
- Water/dust proof structure
- 4-20mA Analog outputs
- Built-in Calibration Mode
- 2 wires for toxic gases / 3 wires for LEL

Specification

Model	SI-100C			
Measuring gas	Combustible Gas		Toxic Gas	Oxygen
Measuring method	Catalytic	IR	Electrochemical cell	Galvanic
Measuring range	0~100%LEL	0~100%LEL	ref. page 19	0~30%VOL
Sensor life time	> 5 years	> 2 years	> 2 years	< 2 years
Response time	<15sec/90% scale	<30sec/90% scale	ref. page 19	<15sec/90%scale
Resolution	1%LEL	1%LEL	ref. page 19	0.1%VOL
Cable/Distance	Signal cable: 3-wire > CVVSB 1.5sq or AWG20		Power + Signal cable: 2-wire > CVVSB 1.5sq or AWG20	

Measuring type	Diffusion Type
Accuracy	±3%/Full scale
Parameter	Control Switch(calibration), Admin Console(maintenance, OPTION)
Operation mode display	2-LED(Operating and Zero Cal, Span Cal. LED)
Output signal	4-20mA DC(3wire for combustible gas, 2wire for other gas)
Conduit connection	NPT 3/4" (2way)
Mounting type	Wall mount
Setting	1 Switch Interface(Calibration), Console set available(Option)
Remote Set	via Console (Zero Calibration, Span Calibration, Calibration Gas Concentration Set, Factory default,4-20mA Calibration, Range Set, Data Logging)
Operating temperature	-20°C ~ +55°C
Operating humidity	5% to 95% RH(Non-condensing)
Operating power	9~34Vdc 600mA
Material	Aluminium, Stainless steel(STS304)
Dimensions	102(W) × 137(H) × 87(D)mm
Weight	1.0kg
Option	Console
Approval	**ATEX** Ex d IIC T5 Gb IP65 **CSA** (Under certification) **IECEx** Ex d IIC T5 IP65 **INMETRO** Ex d IIC T5 Gb IP65

C. Assagador de Pedreguer, 16 - 03760 Ondara (Alicante)
Tel 965 034 807 - 675 549 912
www.citer.es - info@citer.es

SENKO CO., LTD.

SI-100C

Operating Manual

⚠WARNING

Read this manual carefully before using the instrument. The instrument will perform as designed only if it is used and maintained in accordance with the manufacturer's instruction. Otherwise, it could fail to perform as designed and persons who rely on this instrument for their safety could sustain serious personal injury or death.

This manual contains operating instructions for stationary gas monitoring instruments designed for area air quality and safety applications, and should be STUDIED CAREFULLY by all persons responsible for the operation and maintenance of the instruments. All SENKO equipment described herein is designed or manufactured for use only as set forth herein and by the labels affixed, or other literature accompanying the product.
Where WARNINGS or CAUTIONS are herein set forth, they must be followed. If SENKO equipment is used in a manner or under conditions not specifically authorized or prescribed by this manual, or by other materials or written instructions either accompanying the product or authorized by SENKO in writing, or if it is used or maintained by unqualified or improperly trained personnel, SENKO Co., Ltd. disclaims all responsibility of every kind for said equipment. While basic connection installation instructions are included, all equipment must be installed by qualified personnel. FOLLOWING ALL ASPECTS OF THE LOCAL CODE REQUIREMENTS. Also, the instruments must be calibrated and alarms tested periodically by trained personnel for proper functioning of the instruments.
CAUTION: The overall system, especially where gas monitoring sensors are used, must be CALIBRATED BY QUALIFIED PERSONNEL. Thereafter, a monthly calibration check is recommended to assure reliability and accuracy.
Please call the factory if any problems are encountered.

WARRANTY

SENKO sensors and instruments are designed for area air quality and safety applications. SENKO gas monitoring instruments are provided with a one year warranty. This warranty covers only defective parts or workmanship in normal use and service. Instruments which fail to function due to factory defect
Within one year of date of shipment are to be returned to SENKO for warranty repair. SENKO will determine the nature and responsibility for the defect. In all cases the warranty is limited to the original cost of the equipment. Any misuse of equipment is the customer’s responsibility. SENKO will either repair or replace (at SENKO’s option) returned instruments subject to the warranty, at no charge. No field service is included in this warranty. For field service requirements please contact SENKO.
This warranty is voided by:
1. Improper application of instrument.
2. Misuse of instrument.
3. Intentional or accidental damaging of instrument.
4. Not returning the sensor to factory for warranty validation.

For any queries regarding warranty repair or replacements, please include the instrument model and serial number in any transmittals to SENKO. SENKO instruments are supplied with operating and installation manuals and other literature. These are the only source of specific details regarding proper operation and maintenance of the equipment. These instructions must be carefully read and the precautions followed in detail. Instruments must be calibrated and alarms checked periodically to assure proper equipment operation. Please refer to the manual for details.

Table of contents

Introduction

Features

1. Inlet for cable (NPT3/4")
2. Top case
3. Hole for grounding (M4)
4. Part for installation of the detector (M5)
5. Sensor

Specification

Model	SI-100C			
Detecting	Diffusion Type			
Measuring Gas	Combustible Gas		Toxic Gas	Oxygen
Measuring Method	Catalytic	IR	Electrochemical cell	Galvanic
Accuracy	± 3% / Full Scale			
Alarm	1st alarm, 2nd alarm			
Output Signal	Analog Output:4-20mA			
Cable/ Distance	Analog : 4-20mA/Maximum 2,500m			
Operating Humdity	-20°C ~ 50°C, 5~95% RH (Non-condensing)			
Operating Power	10~30V DC			
Dimensions	150(W) X 165(H) X 110(D)mm, 1.0kg			
Approval	Ex d ⅡC T5, IP65			

Sensor Specification

Gas	Range	Low	High
O2	0~30%VOL	19%VOL	23%VOL
CO	0~500PPM	30PPM	60PPM
SO2	0~20PPM	2PPM	5PPM
H2	0~1000PPM	100PPM	500PPM
H2S	0~200PPM	10PPM	15PPM
NH3	0~100PPM	25PPM	35PPM
LEL(CH4)	0~100%LEL	20%LEL	40%LEL

Electrical Wiring

3 WIRE SAMPLE 2 WIRE SAMPLE

1
2
3

1
2

PIN	3-Wire	Color
1	Power (+), 24V DC	RED
2	4~20mA Signal Output	WHITE
3	Ground (-)	BLACK

PIN	2-Wire	Color
1	Power (+), 24V DC	RED
2	4~20mA Signal Output	WHITE

Calibration

Z: Zero Calibration

-Entry to Zero Calibration-

It shows RED light on the LED marked Z when you supplied power to the instrument.

-Execution of Zero Calibration-

Press the button for more than 3 seconds to execute zero Calibration at the state of lighting on the LED marked Z.

-Completion of Zero Calibration-

Zero Calibration proceeds for 3 seconds and will be completed. Processing time of Zero calibration may vary depending on each gas sensor applied. LED marked Z blinks during the process and will be lighted from Z to S repeatedly when it finished.

S: Span Calibration

-Entry to Span Calibration-

It shows RED light on the LED marked Z when you supplied power to the instrument. At this time, press button once to move to Span Calibration mode. You will be seen the AMBER light on the LED marked S.

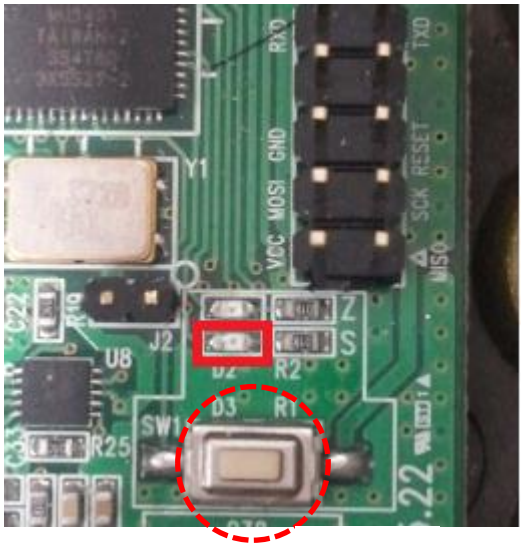
It's shifted from Zero(**RED**) to Span(**AMBER**) repeatedly by pressing the button.

-Execution of Span Calibration-

Prepare and supply the Standard gas into the gas sensor part of the instrument and then press the button for more than 3 seconds to execute Span Calibration at the state of lighting on the LED marked S.

-Completion of Span Calibration-

Processing time of Span Calibration vary depending on each sensor applied. LED marked S blinks during the process and will be lighted from S to Z repeatedly when it finished.



LED
Zero: RED / Span: Orange

	LEL	CO	H2S	O2
Max Range	100% LEL	500 PPM	200 PPM	30% vol.
Gas for Calibration ZERO SPAN	0% LEL 25% LEL	0 PPM 100 PPM	0 PPM 50 PPM	0 % vol. 20.9 % vol.
Flow rate	300 cc/min	300 cc	300 cc	300 cc
Time needed for calibration	ZERO: at once SPAN: 120s	ZERO: at once SPAN: 120s	ZERO: at once SPAN: 120s	ZERO: 120s SPAN: 120s

NOTICE

We recommend calibration once every six months, at least once a year. Sensor's output going down as time goes by; measurement error will increase.
Calibration is crucial for the sensor performance and persons relying on this product for their safety.

⚠WARNING

Do not Fresh Air Calibration unless you are certain you are in fresh, uncontaminated air; otherwise, inaccurate readings can occur which can false indicate that a hazardous atmosphere is safe. If you have any doubts as to the quality of the surrounding air, do not use the Fresh Air Calibration feature. The calibration check is required to verify span accuracy. Failure to follow this warning can result in serious personal injury or death.

Notice for User

Please use the instrument in the range of the applicable temperature, humidity and pressure that are appropriate for the specification of the product. Using the instrument beyond this range may cause malfunction or glitch of the instrument.

Gas concentration measurement value by the sensor or the instrument can vary according to the environment at site (temperature, pressure and humidity). Therefore the calibration of the instrument should be performed at the same or similar environment as that of the instrument use (temperature, pressure and humidity).

If temperature changes sharply during use of the instrument (for instance, using the instrument at places of far different temperatures between indoor and outdoor), the value of the measured gas concentration can be changed suddenly. Please use it after the gas concentration value is stabilized.

Severe vibration or shock to the instrument may cause the sudden change of value of the measured gas concentration. Please use it after the value of gas concentration is stabilized. Excessive shock to the unit can lead to trouble of the sensor or the instrument.

Certification

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEx KTL 14.0014	Issue No: 0	Certificate history: Issue No. 0 (2014-09-05)
Status:	Current	Page 1 of 3	
Date of Issue:	2014-09-05		
Applicant:	SENKO Co., Ltd 73, Osammi-ro, 15 Beon-gil, Osan-si, Gyonggi-do 447-230 Korea, Republic of		
Electrical Apparatus:	SI series Fixed Gas Detector		
Optional accessory:			
Type of Protection:	Flameproof enclosure "d"		
Marking:	Ex d IIC T5 Gb IP65 Tamb : -20°C ~ +55°C		

Approved for issue on behalf of the IECEx Certification Body: Kang Ha-woo

Position: Certification Manager

Signature: (for printed version)

Date: 2014. 09. 05

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

Korea Testing Laboratory
87, Digital-ro, 26-gil, Guro-gu
Seoul
Korea, Republic of

KR HELLAS LTD.
41, Athinas Av., Vouliagmeni,
GR-16671, Athens, Greece

TEL: +30-210-428-6736
FAX: +30-210-428-6728

Certificate No:
KRH 16 ATEX 1018
Issue No: 0 (2016.04.19)

1. # EC-TYPE EXAMINATION CERTIFICATE

2. Equipment and protective system intended for use in potentially explosive atmospheres:
Directive 94/9/EC

3. EC-Type-examination Certificate Number:
KRH 16 ATEX 1018

4. Equipment: **Fixed Gas Detector type SI-100C**

5. Manufacturer: **SENKO Co., Ltd**

6. Address: **73, Oesammi-ro, 15 Beon-gil, Osan-si, Gyonggi-do, 447-230, Korea, Republic of**

7. This equipment or protective systems and any acceptable variation thereto are specified in the schedule to certificate and the documents therein referred to.

8. The KRH certifies that equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, give in Annex II to the Directive 94/9/EC of 23 March 1994. The examination and test results are recorded in the confidential report number KRH-ATEX-0048-2015.

9. Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
EN 60079-0:2012 EN 60079-1:2007

10. If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11. This EC-Type-examination Certificate relates only to the design and construction of the specified equipment or protective systems in accordance with Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment or protective systems.

12. The marking of the equipment shall include the following:
Ⓔx II 2 G Ex d IIC T5 Gb IP65

This certificate is issued at Athens on 19th April 2016, under the authority of the Hellenic Republic of Greece by KR Hellas Ltd., Notified Body No. 2198.

CE

Notified Body No.2198

(KRH Endorse)

Shin Jeong-do
CEO of KR Hellas Ltd

PETROLEUM AND EXPLOSIVES SAFETY ORGANISATION
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन
Ministry of Commerce & Industry
Department of Industrial Policy & Promotion

GOVERNMENT OF INDIA
MINISTRY OF COMMERCE & INDUSTRY
PETROLEUM AND EXPLOSIVES SAFETY ORGANISATION (PESO)
(Formerly Department of Explosives)
CGO COMPLEX SEMINARY HILLS
NAGPUR 440006

Letter No:
A/P/HQ/MH/104/4828(P385773)
Email :explosives@explosives.gov.in
Phone/Fax No.2510248/2510577
Dated : 18/8/2016

To
M/s. SENKO Co. Ltd.,
73,Oesammi-ro 15beon-gil
Osan-si, Gyeonggi-do,
Rep of Korea, 447-230

Sub:Approval of Gas Detection Instrument under Petroleum Rules, 2002

Dear Sir(s),

Please refer to letter No nil dated 21/07/2016 from M/s. Respo Products Agra,Agra on the above subject.
The following Flame Proof equipment(s) manufactured by you according to IEC 60079-0 : 2007-10 & IEC 60079-1 : 2007-04 standards and covered under M/s. ktl, Korea Test reports mentioned below is/are approved for use in **Zone 1** of Gas Group IIC hazardous areas coming under the purview of the Petroleum Rules, 2002 administered by this Organization.

Sr.No	Description	Safety Protection	**CCEs Identification Number**	**Test House**	Test Report No.	Drawing Numbers
1	SI series Fixed Gas Detector	Ex d IIC T5 Gb IP65	**P385773/1**	M/s. ktl, Korea	IECEx KTL 14.0014 Dt.05/09/2014	as per test report

This Approval is granted subject to observance of the following conditions:-

1). The design and construction of the equipment shall be strictly in accordance with description, condition and drawings as mentioned in the M/s. ktl, Korea Test Reports referred to above
2). The equipment shall be used only with approved type of accessories and associated apparatus
3). Each equipment shall be marked either by raised lettering cast integrally or by plate attached to the main structure to indicate conspicuously
(a) Name of the manufacturer
(b) Name and number by which the equipment is identified
(c) Number & Date of the test Report of the M/s. ktl, Korea applicable to the equipment
(d) CCEs Identification Number of this letter by which use of the apparatus is approved
4). A certificate to the effect that the equipment has been manufactured strictly in accordance with the drawing referred to in the M/s. ktl, Korea test report and is identical with the one tested and certified at M/s. ktl, Korea shall be furnished with each equipment
5). The customer shall be supplied the copy of this letter, an extract of the conditions and maintenance schedule, if any recommended by M/s. ktl, Korea in their test reports and copy of instructions booklet detailing operation and maintenance of the equipment so as to maintain its Flame Proof safety characterestics
6). The After sales service and maintenance of subject equipment shall be looked after by your representative M/s. Respo Products Agra,D-595,,Kamla Nagar,Agra,AGRA (Dist.) ,Uttar Pradesh (State)

This Approval also covers the permissible variation as approved under the M/s. ktl, Korea test report referred above .This approval may be deemed to have been revoked with immediate effect at any time, if any of the conditions subject to which approval has been granted is violated or not complied with. The approval may also be amended or withdrawn at any time, if considered necessary in the interest of safety.

The field performance report from actual users /your customers of the subject equipment may please be collected and furnished to this office for verification and record at regular intervals.

This approval is otherwise valid a period of five years from the date of issue.

中 华 人 民 共 和 国

计 量 器 具 型 式 批 准 证 书

PATTERN APPROVAL CERTIFICATE OF THE MEASURING INSTRUMENTS OF THE PEOPLE'S REPUBLIC OF CHINA

韩国 SENKO CO.,Ltd. :

根据《中华人民共和国计量法》及相关规定和技术要求，下列计量器具经定型鉴定合格，现予批准。

According to the Law on Metrology of the People's Republic of China and the relevant regulations, the pattern of measuring instruments applied for pattern approval have been approved.

计量器具名称及型号：

Name and type of the measuring instruments:

固定式气体检测仪（CH_4，CO，H_2S）（SI-100，SI-100C，SI-100D 型）

制造：[illegible]

计量器具的技术指标见型式注册表。

The technical specifications of the measuring instruments are described in the pattern registration list.

型式批准的标志与编号：

The mark and identification numbers of the pattern approval:

PA

2014 C326

批准时的有效

1. 计[illegible]

2. [illegible]

3. [illegible]

批 准 人
Approval signature 吴清泽

批准部门
Approval authority

批准日期 二〇一四年一月二十三日
Approval date

CNEX
国家防爆

防爆电气设备

防爆合格证

编 号: CNEx15.0745

制造厂家	SENKO Co.,Ltd 73, Oesanmi-ro,15 Beon-gil, Osan-si, Gyonggi-do 447-230 South Korea
产品名称	SI 系列固定式气体检测仪
型号规格	SI-100 9~34VDC
防爆标志	Exd IIC T5 Gb
产品标准	---
总装图号	SENK00705-001-SK1000

经对上述产品图样及技术文件的审查和样品检验，确认符合下列标准：

GB3836.1-2010 《爆炸性环境 第 1 部分：设备 通用要求》
GB3836.2-2010 《爆炸性环境 第 2 部分：由隔爆型“d”保护的设备》

记 事

1.本证书的持证单位为硕骏电子（上海）有限公司。
2.该产品已经通过 IECEx 认证，证书编号为：IECEx KTL 14.0014，报告编号为 KR/KTL/ExTR14.0013/00。
3.本证书可代表产品型号：SI-100，SI-100C，9-34VDC，IP65，防爆标志：Exd IIC T5 Gb。
4.环境温度范围：-20℃~+55℃。

本证有效期 2015 年 3 月 26 日至 2020 年 3 月 25 日

颁发日期 2015 年 3 月 26 日

中心主任

Ex CQST NAN YANG

国家防爆电气产品质量监督检验中心

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