Safety Instruction SS2100a TDLAS Gas Analyzer

ATEX: Zone 2







People for Process Automation

Revision History

Revision	Engineering Order	Date
01.21	EO18935	November 24, 2021

ATEX/IECEX S NO MODIFICATIO SIGNATORY APPF	NOTE: CHEDULE DRAWING. N PERMITTED WITHOUT ROVAL AND REFERENCE
TO THE N	NOTIFIED BODY.

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1 Introduction

Endress+Hauser's SS2100a products are high-speed, diode laser-based
extractive analyzers designed for extremely reliable monitoring of very low
(trace) to standard concentrations of specific components in various back-
ground gases.

In order to operate the analyzer safely, it is important to closely review all information contained in the manuals related to system installation, operation and maintenance, as referenced in Associated Documents below. This manual is divided into the following sections:

- General Safety Instructions (Chapter 2)
- Equipment Installation (Chapter 3)
- Equipment Operation (Chapter 4)
- Equipment Maintenance and Service (Chapter 5)

How to Use ThisTake a moment to familiarize yourself with this manual by reading the Table
of Contents → <a>D i. This manual has been written to address the most com-
mon safety issues related to the installation and maintenance of the
SS2100a analyzer. Additional information has been provided with the ana-
lyzer model purchased to instruct qualified users in the installation, opera-
tion and maintenance of the equipment.

Images, tables and charts have been included with instruction to provide a visual understanding of the analyzers and its functions. Special symbols are also used to provide the user with key information regarding the system configuration and/or operation. Users should pay close attention to this information.

Conventions used in this manual

In addition to the symbols and instructional information, this manual is created with "hot links" to enable the user to quickly navigate between different sections within the manual. These links include table, figure and section references and are identified by a pointing finger cursor $\sqrt[h]{}$ when rolling over the text. Simply click on the link to navigate to the associated reference.

Associated Documents

Enclosed in your analyzer system order is the product Safety Instruction for your reference. Please review all necessary safety instructions before installing or operating your analyzer. This document is an integral part of the complete document package, which is listed in the following table.

Part Number	Document Type	Description
BA02163C	Operating Instruction	Provides a comprehensive overview of the analyzer and step-by-step installa- tion instructions

Part Number	Document Type	Document Type Description	
GP01177C	Description of Device Parameters (FS 5.16)	Provides the user with an overview of the FS 5.16 firmware functionality	
GP01180C	Description of Device Parameters (NS 5.14)Provides the user with an overview of the NS 5.14 firmware functionality		
EA01398C	NH3 Permeation Device Installation Instruction	tion Provides instructions for installing the NH3 perme- ation device into the Sam- ple Conditioning System (SCS)	
TI01668C	Technical Information	Provides technical data on the device with an over- view of associated models available.	

For additional instruction manuals, please refer to the following:

- For custom orders:
 - Refer to the Endress+Hauser website (https://endress.com/contact) for the list of local sales channels to request order-specific documentation.¹
- For standard orders:
 - Refer to the Endress+Hauser website product page to download the published manuals for the analyzer: www.endress.com

Manufacturer Certificates

CE mark

The SS2100a TDLAS Gas Analyzer meets the legal requirements of the applicable EU Directives. These are listed in the corresponding EU Declaration of Conformity along with the standards applied.

Endress+Hauser confirms successful testing of the device by affixing to it the CE mark.

Ex approval

The measuring device is certified for use in hazardous areas and the relevant safety instructions are provided in the separate "Safety Instructions" document. Reference is made to this document on the nameplate.

^{1.} Order-specific documentation is located by analyzer serial number (SN).

The Safety Instructions containing all the relevant explosion protection data is available from the Endress+Hauser website.

Area classifications

Model	Certifications
SS2100a TDLAS Gas Analyzer	ATEX: Ex II 3G Ex dc ec nA opis IIB+H2 T3, Gc, IP66 Tambient = -20 °C to +60 °C

Manufacturer Address Endress+Hauser 11027 Arrow Route Rancho Cucamonga, CA 91730 United States www.endress.com

2 General Safety Information

Each analyzer shipped from the factory includes documentation for the purpose of relaying installing, operating and safety instructions to the responsible party and/or operator of the equipment. This chapter reviews the general safety instruction for every SS2100a analyzer.

Intended Equipment Use The SS2100a analyzer is intended for use as instructed in the documentation package provided with the equipment. The information provided should be read and referenced by anyone installing, operating or having direct contact with the SS2100a analyzer. Any use of the equipment in a manner not specified by Endress+Hauser could impair the protection provided by the equipment.

Warning LabelsInstructional icons are provided in all equipment manuals and on the
SS2 100a analyzer to alert the user of potential hazards, important informa-
tion and valuable tips. Following are the symbols and associated warning and
caution types to observe when installing or servicing the analyzer. Some of
these symbols are provided for instructional purposes only and are not
labeled on the system.

Safety warning label

The warning label shown below will be affixed to the front side of all analyzer enclosures that contain sample gas.



Hazards may vary by stream composition. One or more of the following conditions may apply.



Flammable. Gases used in the processing of this analyzer may be extremely flammable. Any work in a hazardous area must be carefully controlled to avoid creating any possible ignition sources (e.g., heat, arching, sparking, etc.).



Toxins. Endress+Hauser analyzers measure a variety of gases, including high-level H2S. Follow all safety protocols governing toxic gases and potential leaks.



Inhalation. Inhaling toxic gases or fumes may cause physical damage or death.



Technicians are expected to follow all safety protocols established by the customer that are necessary for servicing or operating the analyzer. This may include, but is not limited to, lockout/tag-out procedures, toxic gas monitoring protocols, PPE requirements, hot work permits and other precautions that address safety concerns related to performing service or operation on process equipment located in hazardous areas.

Equipment labels

The following special safety symbols and labeling are used on the equipment to alert the user to potential hazards and important information associated with the gas analyzer. Every symbol and label has significant meaning that should be heeded.

WARNING - DO NOT REMOVE OR REPLACE FUSE WHEN ENERGIZED FUSE: 5X20 MM, T, L, 250 VAC, 1 A



ENERGIZED FUSE WARNING - Do not remove or replace fuse when energized.

INVISIBLE LASER RADIATION - Avoid exposure to beam. Class 3b Radiation Product. Refer servicing to the manufacturer or qualified personnel.





CLASS 3B LASER PRODUCT- Invisible laser radiation. Avoid direct exposure to beam. Class 3b laser product.

CLASS 1 LASER PRODUCT - Invisible laser radiation when open. Avoid direct exposure to the beam.

WARNING DO NOT REMOVE! REMOVAL OF THIS SEAL VOIDS WARRANTY

DO NOT REMOVE - Removing label from measurement cell optical head will void analyzer warranty.



FUSE RATING - Maximum voltage and current specifications for the fuse closest to label.



HAZARDOUS VOLTAGE - Contact may cause electric shock or burn. Turn off and lock out system power before servicing.



GENERAL WARNING - Failure to follow all directions may result in damage or malfunction of the analyzer.



PROTECTIVE EARTH GROUND - Symbol indicates the connection point of the ground wire from the main power source.



FUNCTIONAL EARTH GROUND - Symbol indicates grounding points intended primarily for troubleshooting.

Instructional symbols



General notes and important information concerning the installation and operation of the gas analyzer.



Failure to follow all directions or substitution of components may result in explosion.



Warning statement for **hazardous voltage**. Contact may cause electric shock or burn. Turn off and lock out system before servicing.



Failure to follow all directions may result in fire.



Failure to follow all directions may result in damage or malfunction of the gas analyzer.



Maximum voltage and current specifications for the fuse closest to label.

Analyzer Technical Specifications

For the SS2100a analyzer, a set of technical specifications are provided that outline recommended equipment settings and ratings. This information is provided in Table 2-1 below.

Peripheral devices

For systems equipped with peripheral devices, e.g., probe assemblies, the documentation indicates that only devices that meet with the manufacturer's specifications may be used.

Equipment rating

The following equipment rating information is provided for the SS2100a below. This information includes, but is not limited to, the following:

- Supply voltage, power and current rating
- Description of all input connections
- Environmental conditions for which the equipment is designed (i.e., environmental temperature range, environmental relative humidity)
- Degree of ingress protection (IP)

Performance	
Concentration	Refer to Calibration Certificate
Repeatability	Refer to Calibration Certificate
Response Time	Display updates vary from 4 to 16 seconds
Application Data	
Environmental Temperature Range	-20 °C to 50 °C (-4 °F to 122° F) — Standard -10 °C to 60 °C — Optional
Heated SCS Enclosure Temperature	50 ± 5 ℃ - Standard 60 ± 5 ℃ - Optional

Table 2-1 SS2100a analyzer specifications

Analyzer Shipment and Storage Temperature	Trace H ₂ O Analyzers: >0 °C (32 °F) All other analyzers: \geq -20 °C (-4 °F)		
Environmental Relative Humidity	5% to 95%, Non-condensing		
Altitude	Up to 2000 m (6,550 ft.)		
Pressure to Cell ¹	70 kPaG (10 PSIG) - max to spectrometer cell		
Sample Cell Pressure Range ¹	800 to 1200 mbar - <i>Standard</i> 950 to 1700 mbar - <i>Optional</i>		
Sample Flow Rate ¹	0.5 to 4 SPLM (0.02 to 0.1 SCFM)		
Electrical & Communic	lectrical & Communications		
Input Power (Electronics) ²	120 or 240 VAC ± 10%, 50/60 Hz; 60W max. (with 2 solenoids)		
Input Power (Sample Cabinet) ¹	120 or 240 VAC \pm 10%, 50/60 Hz - Standard 100W or 200W max for heated systems		
Analog Communication	Isolated Analog channels, 1200 ohms at 24 VDC max <i>Outputs</i> : (2) 4–20 mA (measurement value) <i>Inputs</i> : (1) 4–20 mA (pipeline pressure) ¹		
Serial Communication	Ethernet & RS-485 half-duplex		
Digital Signal	<i>Outputs</i> : (5) Hi/Lo Alarm, General Fault, Vali- dation Fail ¹ , Validation 1 Active ¹ , Validation 2 Active ¹ <i>Inputs</i> : (2) Flow Alarm ¹ , Validation Request ¹		
LCD Display	Concentration, cell pressure and temperature, diagnostics		

Application dependent.
Supply voltage not to exceed ± 10% of nominal. Transient over-voltages according to Over-voltage category II.

Physical Specifications		
Electronics Enclosure	IP66 Copper-Free Aluminum with Weather Resistant Polyester Powder Coating, 80 to 120 micron thickness	
SCS Enclosure	IP55 (min) 304 or 316L stainless steel	
Sample Cell Construction	316L series polished stainless steel (standard)	
Analyzer Dimensions	1628 mm H x 762 mm W x 427 mm D (64.1 in x 30.0 in. W x 16 13/16 in. D)	
Analyzer Weight Approximately 130 kg (286 lbs) (typical) ¹		
Area Classification		
Certification	Gc, IP 66, EMC Directive 2014/30/EU, ATEX Directive 2014/34/EU	

1. Application dependent.

Potential Risks Affecting Personnel

This section addresses the appropriate actions to undertake when faced with hazardous situations during or before service of the analyzer. It is not possible to list all potential hazards within this document. The user is responsible for identifying and mitigating any potential hazards present when servicing the analyzer.



Technicians are expected to follow all safety protocols established by the customer that are necessary for servicing the analyzer. This may include, but is not limited to, lockout/ tagout procedures, toxic gas monitoring protocols, personal protective equipment (PPE) requirements, hot work permits and other precautions that address safety concerns related to performing service on process equipment located in hazardous areas.

Personnel responsibility



The safety of the analyzer is the responsibility of the installer and the organization he/she represents.

Operatives/technicians shall possess, to the extent necessary to perform their tasks, the following:

- Understanding of the general principles of explosion protection
- Understanding of those aspects of equipment design that affect the protection concept
- Understanding of the certificate contents and relevant parts of the standard associated with the product
- General understanding of inspection and maintenance requirements of IEC 60079-17
- Familiarity with the particular techniques to be employed in the selection and installation of equipment in the standard
- Understanding of the additional importance of permit to work systems and safe isolation in relation to explosion protection

Mitigating Risks Refer to the instructions for each situation listed below to mitigate associated risks.

Exposure to process gases

- 1. Shut off the process gas to the gas analyzer before any service that would require opening a part of the sample plumbing.
- 2. Purge the system with nitrogen.
- 3. Shut off the nitrogen purge before opening any part of the sample system.

Exposure to toxic gas (H₂S)

Follow the procedure below if there has been any suspected leak from the sample system and accumulated SCS enclosure.

- 1. Purge the SCS enclosure to remove any potentially toxic gas.
- 2. Test the H₂S levels of the SCS enclosure using the port from the safety purge kit to ensure the purge has cleared any toxic qas.
- 3. If no gas leak is detected, open the SCS enclosure door.



Follow all safety protocols governing toxic gases and potential leaks.

Electrocution hazard

1. Shut off power at the main disconnect external to the analyzer.



Complete this action before performing any service that requires working near the main input power or disconnecting any wiring or other electrical components.

2. Open enclosure door.

If service must be performed with power engaged (gain adjustment, etc.):

- 1. Note any live electrical components and avoid any contact with them.
- 2. Only use tools with a safety rating for protection against accidental contact with voltage up to 1000V (IEC 900, ASTF-F1505-04, VDE 0682/201).

Explosion hazard

Any work in a hazardous area must be carefully controlled to avoid creating any possible ignition sources (e.g., heat, arcing, sparking, etc.). All tools must be appropriate for the area and hazards present. Electrical connections must not be made or broken with power on (to avoid arcing).

3 Equipment Installation

The information in this chapter is related to safety during the equipment installation.



Endress+Hauser Class I Division 2 analyzers use a nonincendive protection method, and as such all portions of the local installation codes apply. The maximum allowed inductance to resistance ratio (L/R ratio) for the field wiring interface must be less than 25 μ H/ Ω . The maximum total loop capacitance shall be 0.27 microfarads.



The safety of the analyzer is the responsibility of the installer and the organization he/she represents.



Configurations requiring optional accessories, e.g., probe assemblies, with specific characteristics must meet manufacturer specifications.

Lifting/Carrying the Gas Analyzer

Before removing from the crate, move the analyzer as close as possible to the final installation location. Due to the gas analyzer's size and weight (configurations weigh approximately 130 kg [286 lbs]), Endress+Hauser recommends the use of a forklift, pallet jack, etc. to lift and/or move the gas analyzer. Never lift the analyzer by the electronics enclosure or conduit runs.

If the gas analyzer is to be lifted by hand, designate multiple individuals and distribute the weight among personnel to avoid injury. Always carry the load using one of the following points/methods (refer to the drawings included with the purchased SS2100a analyzer model):

- Mounting points on Unistrut frame
- Cross members on Unistrut frame
- Support beneath instrument (best used when employing a forklift)



Ensure all equipment used for lifting/moving the analyzer is rated for the weight load.



Bolts or screws used for wall-mounting the SS2100a must be able to support four times the weight of the instrument, approximately 130 kg (286 lbs).



Figure 3-1 Lifting points for the SS2100a gas analyzer

Mounting the Analyzer

The SS2100a gas analyzer is manufactured for wall or Unistrut[®] (or equivalent) metal framing installations. Typically, the SS2100a will come mounted on a Unistrut frame that can be installed on a wall. For detailed mounting dimensions, refer to the SS2100a Operating Instruction $\rightarrow \bigoplus 1$.



When mounting the analyzer, be sure to position the instrument so that it is not difficult to operate adjacent devices. Allow 1 meter (3 feet) of room in front of the analyzer and any switches.



It is critical to mount the gas analyzer so that the supply and return lines reach the supply and return connections on the chassis, while still maintaining flexibility, so that the sample lines are not under excessive stress.

Electrical Wiring Requirements

Check the manufacturing data label or the terminal block labels to determine the power input requirements. All work should be performed by personnel qualified in electrical installation. To consult the wiring diagrams in the system drawings, refer to the SS2100a Operating Instruction $\rightarrow \square 1$.



Cables used shall comply with electrical code, standards, be suitable for the glands and meet the local regulations.



Hazardous voltage and risk of electric shock. Turn off and lock out system power before opening the electronics enclosure and making any connections.

External circuit breaker requirements



An approved switch or circuit breaker rated for 15 amps should be used and clearly marked as the disconnecting device for the analyzer.



Because the breaker in the power distribution panel or switch will be the primary means of disconnecting the power from the analyzer, the power distribution panel or switch should be located in close proximity to the equipment and within easy reach of the operator.

Protective Chassis and Ground Connections

Before connecting any electrical signal or power, the protective and chassis grounds must be connected. Requirements for the protective and chassis grounds include the following:

- Protective and chassis grounds must be of equal or greater size than any other current-carrying conductors, including the heater located in the sample conditioning system
- Protective and chassis grounds to remain connected until all other wiring is removed
- Insulated protective and chassis ground wiring must use the green/yellow color
- Protective grounding wire current carrying capacity must be at minimum the same as the main supply
- Earth bonding/chassis ground shall be at least 12 AWG (4 mm2)



Failure to properly ground the analyzer may create a high-voltage shock hazard.

Color coding

Green-and-yellow insulation shall only be used for:

- Protective earth conductors
- protective bonding conductors
- potential equalization conductors for safety purposes
- functional earth

Connections to the Supply

Use the following procedure to connect the sample supply line.

Consult the layout and flow diagrams in the system drawings. All work must be performed by technicians qualified in pneumatic tubing.



Process samples may contain hazardous material in potentially flammable and/or toxic concentrations. Personnel should have a thorough knowledge and understanding of the physical properties and safety precautions for the sample contents before installing the SCS.

Using 1/4 in. O.D x 0.035 in. wall thickness, seamless stainless steel tubing is recommended. Refer to the system layout drawings for supply and return port locations.

To connect the sample supply line



Consult sample probe manufacturer instructions for proper installation procedures.



The process sample at the sample tap may be at a high pressure. Use extreme caution when operating the sample probe isolation valve and field sample reducing pressure regulator.



All valves, regulators, switches, etc. should be operated in accordance with site lock-out/tag-out procedures.

- 1. Connect the supply and return tubes to the analyzer using the stainless steel compression-type fittings provided.
- Tighten all new fittings 1-1/4 turns with a wrench from finger tight. For connections with previously swaged ferrules, thread the nut to the previously pulled up position, then tighten slightly with a wrench. Secure tubing to appropriate structural supports as required.

3. Check all connections for gas leaks. Using a liquid leak detector is recommended.



Do not exceed 10 PSIG (0.7 barg) in sample cell. Damage to cell may result.

Ventilation Requirements

There are no special requirements for ventilation of the analyzer. For information related to mitigating risks associated with process gases, etc $\rightarrow \textcircled{B}$ 7.

4 Equipment Operation

This chapter provides an overview of safety operational instructions for the SS2100a analyzer.

- Firmware Version Each Endress+Hauser analyzer operates based on its own version of firmware. The firmware version for each analyzer is listed in the system calibration report, and displays upon start-up of the analyzer. Description of Device Parameters can be found on the Endress+Hauser website (www.endress.com).
- **Operating Controls** The front panel mounted keypad enables the operator to modify measurement units, adjust operational parameters, and perform diagnostics. These instructions are found in the appropriate Description of Device Parameters.

During normal operation, the LCD continuously displays the measured component's concentration, sample cell temperature, and sample cell pressure.

To activate any functions on the keypad, press the mode key **#** followed by a number on the keypad to specify a mode.



You must press the **#** key before pressing a number or function key to trigger a response from the keypad.

When you press the **#** key, the words <MODE MENU> display on the LCD. If the keypad watchdog is enabled, a countdown timer will begin when <MODE MENU> displays. If the countdown expires and no buttons have been pressed, the analyzer will automatically revert to **Mode 1**.

The * key functions as the "Enter" key. When in **Mode 2**, always press * after entering a value using the keypad (unless the entry was made in error). Pressing the * key stores the displayed parameter value and cycles the LCD to the next parameter.

If you do make an error, press the * key followed by the TEST key, and then the * key to return to the parameter and enter the correct value.



Figure 4-1 Keypad for ATEX-certified analyzers

- 1. Change parameters
- 2. Scrubber life data
- 3. Mode menu key
- 4. Enter key
- 5. Export diagnostic data
- 6. Exponent value
- 7. Scroll direction and analog input test

- 8. Validation results
- 9. Activate validation 2
- 10. Activate validation 1
- 11. Analog output test
- 12. Diagnostics parameters
- 13. Activate process gas

Intermittent Operation

To isolate the measurement cell for short-term shutdown

The analyzer can be isolated from the primary sample bypass section for short-term shutdown or maintenance of the analyzer while allowing the sample bypass flow to continue in a steady-state mode.



Due to the high pressure of the process sample, it is advisable to allow the sample bypass flow to continue during shortterm isolation of the analyzer. Continuing sample bypass flow allows the field pressure regulator to continue normal operation without possible overpressure and activation of the relief valve in the event the pressure regulator leaks when the downstream flow is discontinued.

- 1. Close the sample flow meter metering valve (adjustment knob turned clockwise) for each measurement channel. Do not overtighten the metering valves or damage could occur.
- 2. Allow any residual gas to flow out of the measurement cells.



Never purge the analyzer with air or nitrogen while the system is powered up.

3. Close the low pressure flare or atmospheric vent header shut-off valve for the effluent from each measurement cell.



If the system will not be out of service for an extended period, it is advised that power remain applied to the sample transport line electric tracer, if applicable, and the sample system enclosure heater.

To isolate the SCS for short-term shutdown

The SCS can be isolated from the process sample tap for short-term shutdown or maintenance of the SCS without requiring the shutdown of the field pressure reducing station.



Process samples may contain hazardous material in potentially flammable and/or toxic concentrations. Personnel should have a thorough knowledge and understanding of the physical properties and safety precautions for the sample contents before operating the SCS. For more information $\rightarrow \square 9$.

Although the pressure reducing regulator at the process sample tap is designed for "bubble-tight" shut off, this condition may not occur after the system has been in operation for an extended period. Isolation of the SCS from the field pressure regulator will discontinue sample flow and may cause the pressure at the outlet of the field pressure regulator to slowly increase if "bubble-tight" shut off of the pressure regulator does not occur. The slow pressure increase will continue until the pressure setpoint of the relief valve is reached and the excess pressure is vented by the relief valve. Although this situation is not intended, it does not cause a significant problem if the SCS is only isolated for a short period. Only a small amount of process sample will be vented when the relief valve opens because the pressure regulator will continue to act as a flow restriction.

- 1. Isolate the analyzer from the bypass following the procedure on $\rightarrow \implies$ 18.
- 2. Close the sample supply shut-off valve to the SCS.
- 3. Allow the sample bypass to flow until all residual gas has dissipated from the lines as indicated by no flow on the sample bypass flow meter.

- 4. Close the low pressure flare or atmospheric vent header shut-off valve for the effluent from the sample bypass.
- 5. Turn off power to the analyzer.



If the system will not be out of service for an extended period, it is advised that power remain applied to the sample transport line electric tracer, if applicable, and the sample system enclosure heater.

5 Equipment Maintenance and Service

This chapter provides safety information for the maintenance and service of the SS2100a analyzer.

PotentiallySS2100a analyzers that detect H_2S can acquire leaks that lead to unsafeHazardous Substancesamounts of toxic gas. For more information $\rightarrow \cong 8$.

Disposal of hazardous substances



H₂S scrubbers and scrubber indicators contain Copper (II) Oxide [CAS# 1317-38-0] and basic cupric carbonate [CAS# 12069-69-1], which are harmful if swallowed and toxic to aquatic organisms. Handle with care and avoid contact with the internal substances.

For analyzers equipped with H_2S scrubbers, discard used scrubber and scrubber indicator in an appropriate leak-proof receptacle $\rightarrow \square 25$.

To keep the sampling lines clean

 Make sure that a membrane separator filter (included with most systems) is installed ahead of the analyzer and operating normally. Replace the membrane if necessary.



If liquid enters the cell and accumulates on the internal optics, a **Laser Power too Low** fault message at the display will result.

- 2. Turn off the sample valve at the tap in accordance with site lock-out, tag-out rules.
- 3. Disconnect the gas sampling line from the sample supply port of the analyzer.
- 4. Wash the sampling line with isopropyl alcohol or acetone and blow dry with mild pressure from a dry air or nitrogen source.
- 5. Once the sampling line is completely free of solvent, reconnect the gas sampling line to the sample supply port of the analyzer.
- Check all connections for gas leaks. Using a liquid leak detector is recommended.

To prevent electrostatic discharge

1. Use a damp cloth to clean the displays to avoid static electricity discharge.

Replacement PartsAll parts required for operation of the SS2100a analyzer must be supplied by
Endress+Hauser or an authorized agent. For contact information to deter-
mine specific parts listing for the purchased model $\Rightarrow \cong 25$.

Instructions for Cleaning and Decontamination

Fuse Ratings and Characteristics



Hazardous voltage and risk of electric shock. Turn off and lock out system power before opening the electronics enclosure and making any connections.



If you need to replace a fuse, use only the same type and rating of fuse as the original. Refer to specifications listed in Fuse specifications for 120 VAC systems or Fuse specifications for 240 VAC systems below.

For an illustration of the fuse location in the electronics assembly, refer to the SS2100a Operating Instruction $\rightarrow \cong 1$.

Drawing Reference	Description	Rating
F3	Miniature Fuse, 5 x 20 mm, Time Delay	250 VAC/1.6 A
F4 ¹	Miniature Fuse, 5 x 20 mm, Time Delay	250 VAC/0.5 A
F5 ¹ , F6 ¹ , F7 ¹ , F8 ¹	Miniature Fuse, 5 x 20 mm, Time Delay	250 VAC/0.1 A
F9 ¹	Miniature Fuse, 5 x 20 mm, Time Delay	250 VAC/1.0A
F10 ¹	Miniature Fuse, 5 x 20 mm, Time Delay	250 VAC/2.0 A

Table 5–1 Fuse specifications for 120 VAC systems

1. Housed in fuse terminal blocks. Illuminated LED indicates blown fuse.

Table 5–2 Fuse specifications for 240 VAC systems

Drawing Reference	Description	Rating
F3	Miniature Fuse, 5 x 20 mm, Time Delay	250 VAC/1.6 A
F4 ¹	Miniature Fuse, 5 x 20 mm, Time Delay	250 VAC/0.5 A
F5 ¹ , F6 ¹ , F7 ¹ , F8 ¹	Miniature Fuse, 5 x 20 mm, Time Delay	250 VAC/0.1 A
F9 ¹	Miniature Fuse, 5 x 20 mm, Time Delay	250 VAC/1.0A
F10 ¹	Miniature Fuse, 5 x 20 mm, Time Delay	250 VAC/1.2 A

1. Housed in fuse terminal blocks. Illuminated LED indicates blown fuse.

Replacing the Membrane Separator

Use the following steps to replace a membrane separator.

- 1. Close the sample supply valve.
- 2. Unscrew the cap from the membrane separator.

If the membrane filter is dry:

- 3. Check if there are any contaminants or discoloring of the white membrane. If yes, the filter should be replaced.
- 4. Remove the O-Ring and replace the membrane filter.
- 5. Replace the O-Ring on top of the membrane filter.
- 6. Place the cap back onto the membrane separator and tighten.
- 7. Check upstream of the membrane for liquid contamination and clean and dry out before re-opening the sample supply valve.

If liquid or contaminants are detected on the filter:

- 3. Drain any liquids and clean with isopropyl alcohol.
- 4. Clean any liquids or contaminants from the base of the membrane separator.
- 5. Replace the filter and the O-Ring.
- 6. Place the cap onto the membrane separator and tighten.
- 7. Check upstream of the membrane for liquid contamination and clean and dry out before re-opening the sample supply valve.
- 8. Check connections for gas leaks. Using a liquid leak detector is recommended.

Replacing the Filter

If necessary, use the following steps to replace the filter:

- 1. Close the sample supply valve.
- 2. Unscrew the four screws with a 5/23 in. screwdriver from the base of the filter. Remove the filter unit from the analyzer for disassembly.
- 3. Unscrew and remove the filter cap.
- 4. Remove the top O-Ring.
- 5. Check if there are any contaminants or solid components blocking the metal filter.
- 6. Drain any contaminants found and clean with isopropyl alcohol.
- 7. Replace the top O-Ring.
- 8. Place the filter cap back into position and tighten.
- 9. Place the filter unit into the analyzer and tighten the base with the four screws.
- 10. Check upstream of membrane for liquid contamination and clean and dry out before opening the sample supply valve.
- 11. Check connections for gas leaks. Using a liquid leak detector is recommended.

Replacing the scrubber and scrubber efficiency indicator



All valves, regulators, switches, etc. should be operated in accordance with site lock-out/tag-out procedures.

- 1. Close the sample supply shut-off valve.
- 2. Allow all residual gas to dissipate as indicated by no flow on the sample bypass flow meter.
- 3. Unscrew the compression nuts on the inlet end of the scrubber and scrubber efficiency indicator assembly.
- 4. To install the new scrubber and indicator, insert the inlet and outlet tubes into the compression fittings of a new scrubber and scrubber efficiency indicator assembly, ensuring each are oriented correctly, according to the flow pattern shown below.



Figure 5-1 Scrubber and scrubber efficiency indicator

- Tighten all new fittings 1-1/4 turns with a wrench from finger tight. For connections with previously swaged ferrules, thread the nut to the previously pulled up position, then tighten slightly with a wrench.
- Reset the scrubber lifetime monitor with the New Scrub Installed parameter and the General Fault Alarm with the Reset option for the General Alarm DO parameter (see "To change parameters in Mode 2" in the Description of Device Parameters for your analyzer).
- 7. Restart the SCS.
- 8. Check all connections for gas leaks. Using a liquid leak detector is recommended.
- 9. Re-validate the system with an appropriate gas standard following the instructions under **"Validating the Analyzer"** in the Description of Device Parameters for your analyzer.
- 10. Purge the scrubber and scrubber efficiency indicator assembly with nitrogen to remove all flammable gas and cap the inlet and outlet.

Disposal of Used Scrubbers



Depleted H_2S scrubbers and scrubber indicators contain predominantly Copper (II) Sulfide [CAS# 1317-40-4] with some remaining Copper (II) Oxide [CAS# 1317-38-0] and basic cupric carbonate [CAS# 12069-69-1], each of which are odorless dark powders that require few special precautions other than avoiding contact with the internal substances, keeping the scrubber tightly sealed and protecting the contents against humidity.

To dispose of used scrubbers

1. Discard used scrubber and scrubber indicator in an appropriate leak-proof receptacle.

Service

For Service, refer to our website for the list of local sales channels in your area (https://www.endress.com/contact).

Service Repair Order

If returning the unit is required, obtain a **Service Repair Order (SRO) Num**ber from a Sales channel representative before returning the analyzer to the factory. Your representative can determine whether the analyzer can be serviced on site or should be returned to the factory. All returns should be shipped to:

Endress+Hauser 11027 Arrow Rte. Rancho Cucamonga, CA 91730-4866 United States of America 1-909-948-4100

XA02782C/66/EN/01.21

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