

AccuLase D1

Hydrogen Sulfide Analyzer

Installation and Safety Manual

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NOTICES

All information in this manual is subject to change without notice and does not represent a commitment on the part of Galvanic Applied Sciences, Inc.

Note: Changes or modifications not expressly approved by Galvanic Applied Sciences, Inc. could void the user's authority to operate the equipment.

Purpose

This manual describes how to safely install the AccuLase D1 Analyzer.

Important

Read Section 1 before proceeding to use the AccuLase D1 Analyzer. Galvanic Applied Sciences is not responsible for any deviation from this manual.

Scope

If products and components from other manufacturers are used, these must be recommended or approved by Galvanic Applied Sciences.

Due to design changes and product improvements, information is subject to change without notice. The manufacturer reserves the right to change hardware and software design at any time, which may subsequently affect the contents of this manual.

The manufacturer assumes no responsibility for any errors that may appear in this manual. The manufacturer will make every reasonable effort to ensure that the manual is up to date and corresponds with your AccuLase D1 Analyzer.

Users

The AccuLase D1 Analyzer described in this manual is intended for use by trained personnel. Trained personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with the AccuLase D1 Analyzer. For startup or technical assistance contact

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1. AccuLase D1 Analyzer General Information

1.1 General Information

The Galvanic Applied Sciences AccuLase D1 analyzer uses Tunable Diode Laser Absorption Spectroscopy to determine the concentration of a target gas species in a variety of gaseous process streams.

1.2 Analyzer Specifications

1.2.1 Outputs / Interface

Outputs	<ul style="list-style-type: none"> • 4 x 4-20 mA output proportional to H₂S concentration, self-powered, isolated from the analyzer and from each other. • 4 x Dry Contact Relays (Form C) for concentration alarm annunciation and fault alarm annunciation. • 8 x solenoid drivers (4 streams, auto calibrate / validate span, auto calibrate / validate zero, 2 spare). For low powered 12 VDC solenoids. • Ethernet for modbus TCP/IP. • Ethernet for remote GUI log in. • Serial Ports for Modbus and communication to PSI module. <ul style="list-style-type: none"> ○ Default configuration will be 3 x RS232 and 1 x RS485 (2 x RS232 for lasers, 1 x RS232 for modbus, 1 x RS485 for modbus) • PID temperature control (Pulse Width Modulation) • 2 LEDs (Alarm and Keypad)
Inputs	<ul style="list-style-type: none"> • 4 x Discrete Inputs for on demand stream switching, or on demand validation or alarm devices, isolated and jumper selectable between wet and dry. • 4 x Analog Inputs (1 x RTD for gas temperature, 1 x pressure for cell pressure, 2 x loop or self-powered 4-20 mA devices, pressure transducer, RTD).
Operator Interface	<ul style="list-style-type: none"> • 5.7" VGA TFT Display • Handheld Keypad for status and data input • 2 LEDs for quick status

	<ul style="list-style-type: none"> • Remote PC application program
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1.2.2 Instrument Specifications

Size	1016 mm (36") W x 914 mm (40") H x 279 mm (11") D
Weight	86 kg (190 lbs)
Ambient Temp. 10-50°C (without enclosure)	-20 °C to +50°C

1.3 Safety Information

1.3.1 General Safety Information

Manufacturer:	Galvanic Applied Sciences Inc.
Manufacturer's Address:	7000 Fisher Road SE Calgary, Alberta Canada, T2H 0W3
Assessment Standards:	CSA/UL 60079-0 CSA/UL 60079-1 CSA/UL 60079-11 CSA/UL 601010-1 CSA C22.2 No 30 ANSI/UL 1203

When installing, operating, and maintaining the AccuLase D1 Analyzer, adhere to the following safety and handling precautions:

- Read and understand the manual before working with the analyzer.
- Pay attention to warning labels on containers, chemicals, enclosures, and packages.
- Only qualified personnel should install, operate, and maintain the analyzer.
- No modifications to the flamepaths are permitted without consultation with the controlled documentation or notified body.
- Use only those bolts supplied with the enclosure. No cover bolts are to be omitted. Install and alternate cover bolt pattern when tightening, see recommended torque value table.

Recommended Torque Value		
Bolt Size	Torque	
3/8" x 1.5"	30 FT LBS	41 Nm

The analog outputs and alarm relay contacts may be powered by a source separate from the one (s) used to power the analyzer system. Disconnecting the main power source may not remove power from the analog output signals

Any safety recommendations or comments contained herein are suggested guidelines only. Galvanic Applied Sciences Inc. bears no responsibility and assumes no liability for the use and/or implementation of these suggested procedures.

This system, when operating in its normal mode, and/or when it is being serviced, maintained, installed and commissioned contains items which may be hazardous to humans if handled or operated incorrectly or negligently. These items include, but are not limited to;

- a) High Voltage Electrical Energy
- b) Toxic and Explosive Gases
- c) Infrared Radiation

1.3.2 Messages and Symbols Used in Manual



The Danger symbol indicates a hazardous situation that, if not avoided will result in death or serious injury.



The Warning symbol indicates a hazardous situation that, if not avoided could result in death or serious injury.



The Caution symbol with the safety alert symbol indicates a hazardous situation that, if not avoided could result in minor or moderate injury.



The Notice symbol is used to highlight information that will optimize the use and reliability of the system.

Please read the following warnings and cautions carefully before using the AccuLase D1 Analyzer



This equipment must be used as specified by the manufacturer or overall safety will be impaired.



Access to this equipment should be limited to authorized, trained personnel ONLY.



Observe all warning labels on the analyzer enclosures.

1.3.3 Warning Symbols Marked on Analyzer



DO NOT OPEN THE ENCLOSURE OR REMOVE THE ENCLOSURE WINDOW UNLESS THE AREA IS KNOWN TO BE NON-HAZARDOUS

This warning is located on the analyzer panel. There is an explosion risk if the enclosure is opened or the window is removed and explosive gases are present.



TO PREVENT IGNITION OF HAZARDOUS ATMOSPHERES ALL SIZE CONDUIT RUNS MUST HAVE AN APPROVED SEALING FITTING CONNECTED WITHIN 3 INCHES (76.2 mm) OF THE ENCLOSURE. COVER JOINTS MUST BE CLEANED BEFORE REPLACING COVER.

This warning is located on the analyzer panel. There is an explosion risk if any electrical connections are made without using an approved sealing fitting. Repair of flamepaths are not intended.



CONNECT INTRINSICALLY SAFE KEYPAD SA2561 ONLY.

This warning is located near the keypad connection.



INVISIBLE LASER RADIATION. CLASS 3b RADIATION PRODUCT. AVOID EXPOSURE TO THE BEAM.

This warning is located on the analyzer panel.

1.3.4 Lifting and Carrying

The analyzer weight is 86 kg. Adhere to local safety and regulatory procedures for lifting items of this size.

1.3.5 Operator Accessible Ports

During normal operation of the analyzer, the controller enclosure window must remain in place. The operator can communicate with the analyzer via a handheld keypad which plugs into a connector located near the top of the analyzer panel. The operator can also communicate with

the analyzer via a personal computer which plugs into a USB port which is located behind the window of the controller enclosure. The personal computer and corresponding USB connection cannot be used unless the area is deemed to be non-hazardous.

1.3.6 External Protective Earthing

The external protective earthing connection is located on the analyzer panel. The ground wire shall be 12 AWG (4 mm²).

1.3.7 Safety Barrier Earthing

The end user is responsible for the supply and installation of the safety barrier permanent earthing conductor(s); one (1) 4mm² or two (2) 2mm². Connection to the barrier earth terminal must be made using a ring crimp terminal. The temporary connection must be removed after the permanent connection has been completed. The upper most entry on the left hand side of the control enclosure is for the safety barrier earthing conductor(s) only.

1.3.8 External Power Switch

The analyzer is designed to be installed at a measurement site on a permanent basis and is permanently connected to the main power supply. A suitably located and easily reached switch must be included in the installation. The switch must be marked as the disconnecting device for the analyzer. The switch must have clearly marked ON and OFF positions. No power consuming components shall be located electrically between the power source and the disconnecting device. See Section 1.3.11 for the power requirements of the analyzer.

1.3.9 Enclosure Entry Location and Size

There are three entries on the electronics enclosure. The power entry is ½" NPT and is located on the top of the enclosure. There are 2 x ¾" NPT entries located on the left side of the enclosure for signal wiring. The Figure 1 below shows the location of the entries.

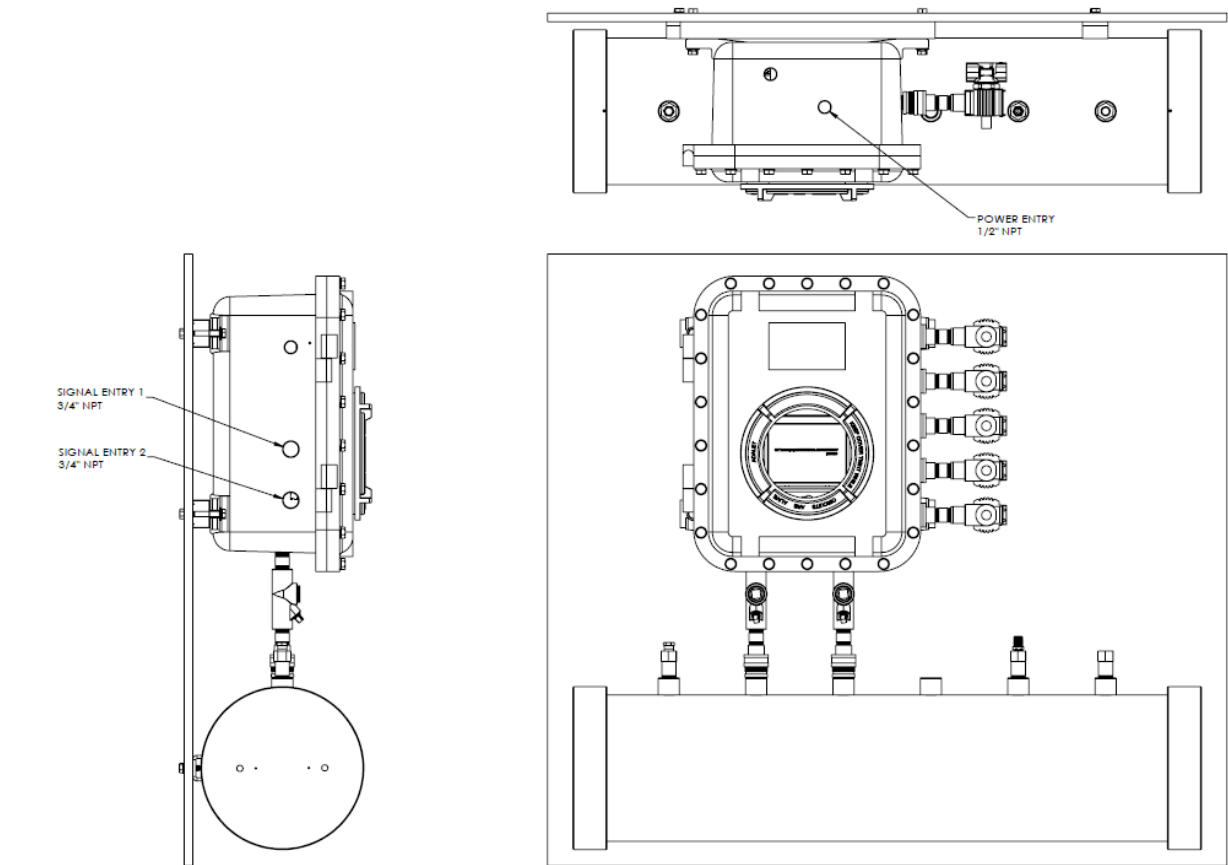


Figure 1: Enclosure Entry Locations

1.3.10 Ventilation Requirements

The analyzer shall be located in a well ventilated area.

1.3.11 Analyzer Ratings

Supply Voltage			
	Voltage (Volts)	Frequency (Hz)	Power (Watts)
	24 DC	NA	80
	110 AC	50/60	110

	230 AC	50/60	110
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Supply Wiring and Fuses	
Insulation Rating for External Circuits, DC Power	Ability to withstand a dielectric strength test at 500 VAC RMS or 700 VDC
Insulation Rating for External Circuits, AC Power	Ability to withstand a dielectric strength test at 1500 VAC RMS or 2100 VDC
Recommended Input Power Wiring	Minimum: 18 AWG (0.9mm ²) Maximum: 8 AWG (8 mm ²)
Temperature Rating for External Wiring	80 °C
Replaceable Fuses	F1 Main Power Input: 5x20mm 250V 3A Time Lag F2 IO Board Power Input: 5x20mm 250V 3A Time Lag F3 Controller Board Input: 5x20mm 250V 3A Time Lag

Input / Output Connections	
Communication	Modbus RS232, Modbus RS485
Analog Outputs	Up to 4, 4- 20 mA, Self-Powered
Relay Outputs	4 x SPDT Mechanical Relay, 250 V, 8A
	8 x Solid State Relay, 60 VDC, 3.5 A or 120 VAC, 3.5 A or 240 VAC, 3.5 A
Digital Inputs	2 x Dry Contact
	2 x Wet Contact, 24 VDC
USB	Isolated USB 2.0

1.3.12 Invisible Laser Radiation

The analyzer employs a laser source which is located in the lower cylindrical enclosure. This is a Class 3b Radiation Product. Avoid exposure to the beam.

1.3.13 Operation and Maintenance

Refer to the AccuLase D1 Operation and Maintenance manual for more information.

2. Installation

2.1 Receiving the System

When the system arrives, inspect the packaging for external signs of damage. If there is any obvious physical damage, contact the shipping agent and Galvanic Applied Sciences to report the damage and request that the carrier's agent be present when the unit is unpacked. It is recommended that you retain the shipping container so that it may be used for future shipment of the unit, if necessary.

2.2 Installation Requirements

2.2.1 Electrical Requirements

Supply Voltage			
	Voltage (Volts)	Frequency (Hz)	Power (Watts)
	24 DC	NA	80
	110 AC	50/60	110
	230 AC	50/60	110

2.2.2 Location of the System

The system is designed to be operated at ambient temperatures from -20°C to 50°C. Galvanic offers complete analyzer shelters from sun shades to complete building, please contact Galvanic Applied Sciences, Inc. (or your local representative) for additional information.

The system should be mounted in a location where it is not exposed to excessive vibration.

2.2.3 Space Requirements



Minimum distance between flange flame paths and adjacent equipment is 1 9/16" (40mm).

The analyzer's dimensions are shown in the Figure 2 below.

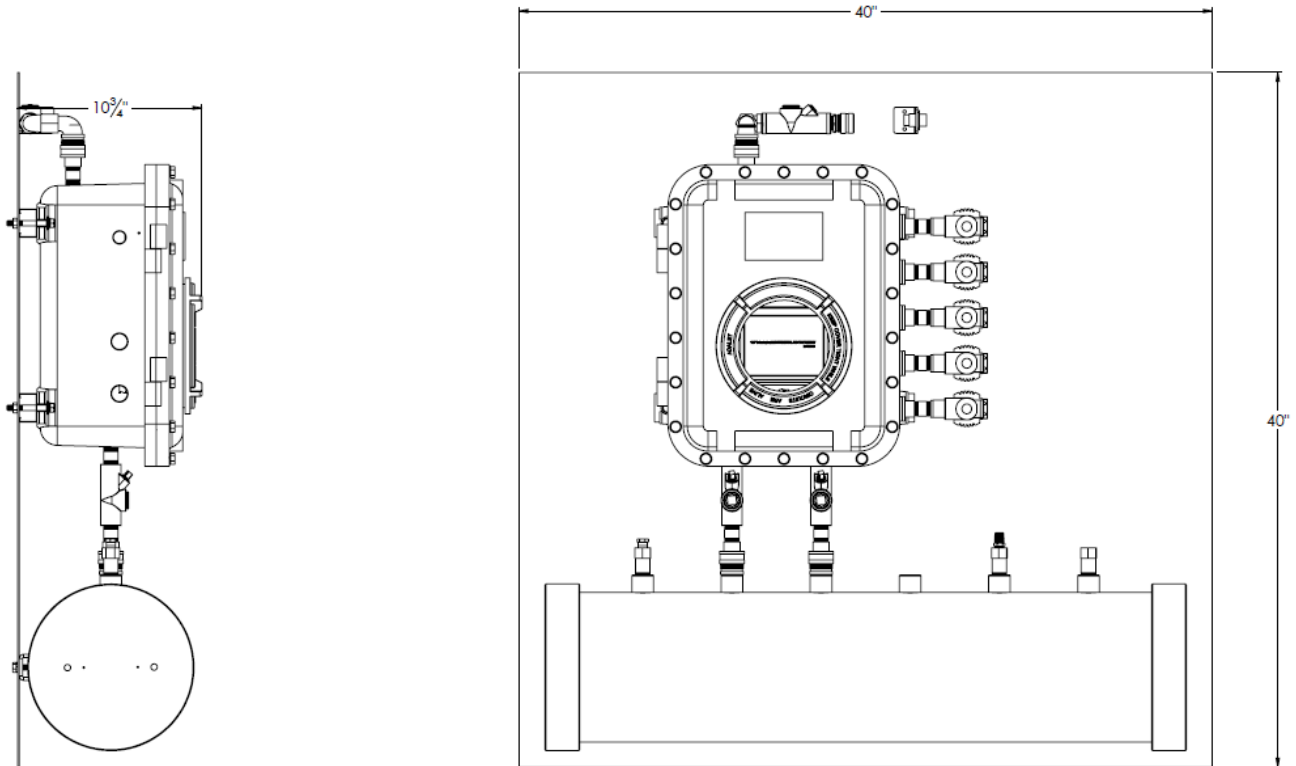


Figure 2: Analyzer Dimensions

2.2.4 Area Classification Information

The analyzer is rated Class 1 Division 1, Groups BCD.

The analyzer is in compliance with the following standards:

CSA/UL 60079-0
CSA/UL 60079-1
CSA/UL 60079-11
CSA/UL 601010-1
CSA C22.2 No 30
ANSI/UL 1203

2.3 Unpacking

To unpack the system:

Open the shipping container and remove all packing material and boxes. Visually inspect the system and accessories packages to ensure that no major damage has occurred. If damage has occurred, contact the shipping company and Galvanic Applied Sciences. Place the small packages aside in a safe, secure storage area as they are not needed at this stage of the system installation.

If any damage is visible do not proceed with the system installation. Do not attempt to facilitate repairs yourself as this will negate and/or invalidate any possible insurance claim or equipment warranty.

2.4 Mounting

The analyzer must be mounted in a vertical position.

Ensure that the mounting hardware and structure is suitable to support the analyzer's weight (86 kg).

2.5 Connecting the Power



All wiring methods must comply with the standards of the jurisdiction having authority.

The power entry is located on the top of the analyzer.

Figure 3 below shows the wiring location and the location of the replaceable fuses.

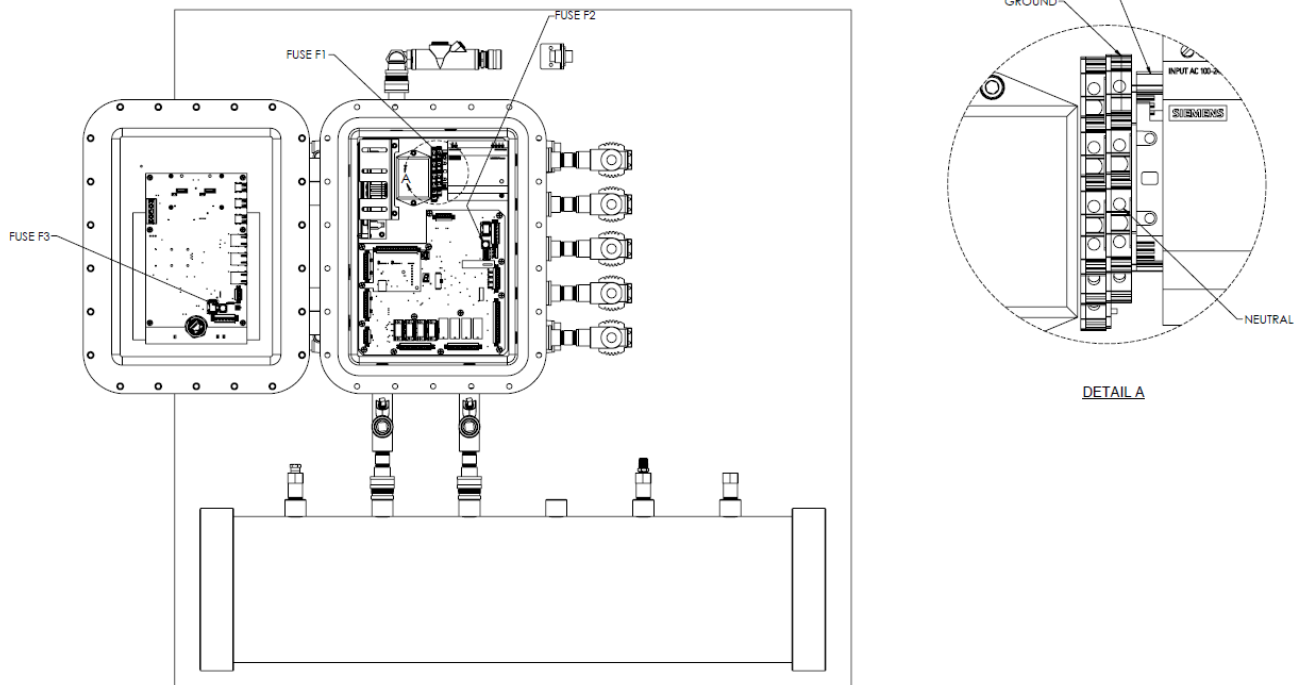


Figure 3: Power Connection and Replaceable Fuse Locations

2.6 Operation and Maintenance

Refer to the AccuLase D1 Operation and Maintenance manual for more information.

2.7 Cleaning



To minimize the risk from electrostatic discharge, clean with dampened cloth – water only.