

Safety Instructions

J22 TDLAS gas analyzer

IECEX/PESO Zone 1



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1 Introduction

Endress+Hauser's J22 TDLAS gas analyzer is a laser-based extractive analyzer for measuring gas concentration. The technology employed is tunable diode laser absorption spectroscopy (TDLAS). Typical measurement ranges vary between 0 to 10 parts-per-million by volume (ppmv) and 0 to 100% by volume.

1.1 Intended equipment use

The J22 TDLAS gas analyzer is intended for use as instructed in the documentation package provided with the equipment. This information should be read and referenced by anyone installing, operating or having direct contact with the analyzer. Any use of the equipment in a manner not specified by Endress+Hauser could impair the protection provided by the equipment.

1.2 Associated documentation

All documentation is available:

- On the media device supplied (not included in the delivery for all device versions)
- On the Endress+Hauser mobile app: www.endress.com/supporting-tools
- In the Downloads area of the Endress+Hauser website: www.endress.com/downloads

This document is an integral part of the document package, which includes:

Part number	Document type	Description
BA02152C	Operating Instructions	A complete overview of the operations required to install, commission, and maintain the device.
TI01607C	Technical Information	Technical data for the device with an overview of associated models available.
SD02192C	Special Documentation Heartbeat Verification	Reference for using the Heartbeat Technology function integrated in the measuring device.

1.3 Certificates and declarations

PESO Certificate of Conformity

Certificate number: P591230/1

IECEX Certificate of Conformity

Certificate number: IECEX SIR 20.0035X

The J22 TDLAS gas analyzer meets the standards and requirements in the table below.

IECEX
IEC 60079-0:2017 Ed. 7.0 IEC 60079-1:2014+COR1:2018 Ed. 7 IEC 60079-11:2011 Ed. 6.0 IEC 60079-28:2015 Ed. 2.0 ISO 80079-36:2016+COR1:2019 Ed. 1 IEC TS 60079-40:2015



1.4 Manufacturer address

Endress+Hauser
11027 Arrow Route
Rancho Cucamonga, CA 91730
USA




www.endress.com

2 General Safety

2.1 Safety symbols

Structure of information	Meaning
 WARNING Causes (/consequences) Consequences of noncompliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation can result in a fatal or serious injury.
 CAUTION Causes (/consequences) Consequences of noncompliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or more serious injuries.
NOTICE Cause/situation Consequences of noncompliance (if applicable) ▶ Action/note	This symbol alerts you to situations which may result in damage to property.

2.2 Symbols

Symbol	Description
	The Laser Radiation symbol is used to alert the user to the danger of exposure to hazardous visible laser radiation when using the system. The laser is a class 3B radiation product.
	The High Voltage symbol that alerts people to the presence of electric potential large enough to cause injury or damage. In certain industries, high voltage refers to voltage above a certain threshold. Equipment and conductors that carry high voltage warrant special safety requirements and procedures.
	Protective Earth (PE). A terminal which is bonded to conductive parts of equipment for safety purposes and is intended to be connected to an external protective earthing system.

2.3 U.S. export compliance

The policy of Endress+Hauser is strict compliance with U.S. export control laws as detailed in the website of the [Bureau of Industry and Security](#) at the U.S. Department of Commerce.

2.4 Labels

2.4.1 Nameplate

An image of the nameplate for the J22 analyzer is shown below. Approvals and warnings are listed on the label, along with other analyzer-specific information, in the blank areas shown below.

Warning: DO NOT OPEN IN AN EXPLOSIVE ATMOSPHERE is listed on all nameplates.

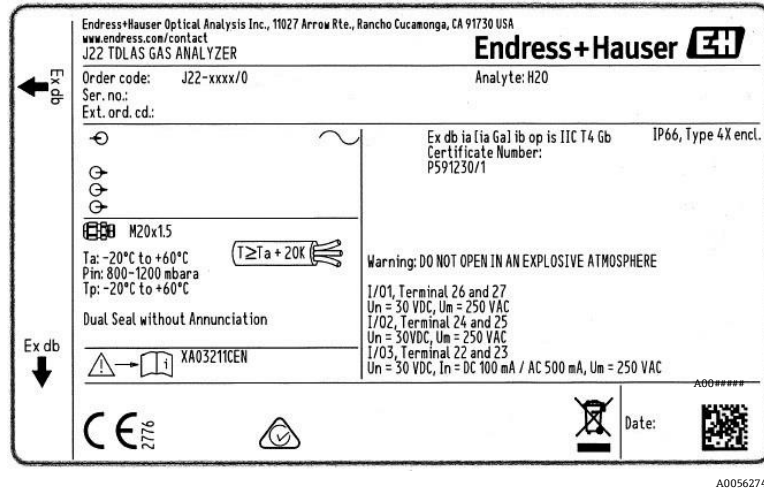


Figure 1: J22 analyzer nameplate with approvals and warnings

2.4.2 Controller

POWER
 Nicht unter Spannung offen
 Do not open when energized
 Ne pas ouvrir sous tension

Terminate power prior to accessing equipment to prevent damage to the analyzer.

Warning: DO NOT OPEN IN
 EXPLOSIVE ATMOSPHERE
 Attention: NE PAS OUVRIR EN
 ATMOSPHERE EXPLOSIVE

Use caution before opening the analyzer enclosure to avoid injury.

2.5 Personnel qualifications

Personnel must meet the following conditions for mounting, electrical installation, commissioning and maintenance of the device. This includes, but is not limited to:

- Be suitably qualified for their role and the tasks they perform
- Be trained in explosion protection
- Be familiar with national and local regulations and guidelines (e.g., IECEx)
- Be familiar with lockout/tagout procedures, toxic gas monitoring protocols and PPE (personal protective equipment) requirements

2.5.1 General

- Adhere to all warning labels to prevent damage to the unit.
- Do not operate the device outside the specified electrical, thermal and mechanical parameters.
- Only use the device in media to which the wetted materials have sufficient durability.
- Modifications to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Endress+Hauser.
- Only open the controller cover if the following conditions are met:
 - An explosive atmosphere is not present.
 - All device technical data is observed (see nameplate).
 - The optional stainless steel label tag is not bonded to earth. The maximum average capacitance of the tag determined by measurement is maximum 30 pF. This must be considered by the user to determine suitability of the equipment in a specific application.
- In potentially explosive atmospheres:
 - Do not disconnect any electrical connections while the equipment is energized.
 - Do not open the connection compartment cover when energized or the area is known to be hazardous.
- Install the controller circuit wiring according to IEC 60079-14.
- Install the device according to the manufacturer’s instructions and regulations.
- The flameproof joints of this equipment are other than the minimums specified in IEC/EN 60079-1 and must not be repaired by the user.

⚠ WARNING

Substitution of components is not permitted.

- ▶ Substitution of components may impair intrinsic safety.

2.6 Equipment training

Refer to local service providers for installation and operational training of the J22 TDLAS gas analyzer.

2.7 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.

NOTICE

Technicians are expected to be trained and follow all safety protocols that have been established by the customer in accordance with the area hazard classification to service or operate the analyzer.

This may include, but is not limited to:

- ▶ Toxic and flammable gas monitoring protocols
- ▶ Lockout/tagout procedures
- ▶ The use of personal protective equipment (PPE)
- ▶ Hot work permits and other precautions that address safety concerns related to the use and operation of process equipment located in hazardous areas

2.7.1 Electrocution hazard

⚠ WARNING

Complete Step 1 before performing any service that requires working near the main input power or disconnecting any wiring or other electrical components.

1. Shut off power at the main disconnect external to the analyzer.
2. Only use tools with a safety rating for protection against accidental contact with voltage up to 1000 V (IEC 900, ASTF-F1505-04, VDE 0682/201).

2.7.2 Laser safety

The J22 TDLAS gas analyzer is a Class 1 laser product, which poses no threat to equipment operators. The laser internal to the analyzer controller is classified Class 3B and could cause eye damage if the beam is viewed directly.

⚠ WARNING

Before servicing, shut off all power to the analyzer.

2.8 Analyzer technical specifications

Technical specifications are provided in the following tables that outline recommended equipment settings, ratings, and physical specifications.

Electrical and communications		
Input voltages	AC 100 to 240 V tolerance $\pm 10\%$, 50/60 Hz, 10W ¹ DC 24 V tolerance $\pm 20\%$, 10W UM = AC 250 V	
Output type	Modbus RS485 or Modbus TCP over Ethernet (IO1)	U _N = DC 30 V U _M = AC 250 V N = nominal M = maximum
	Relay Output (IO2 or IO3)	U _N = DC 30 V U _M = AC 250 V I _N = DC 100 mA/AC 500 mA
	Configurable IO Current 4-20 mA input/output (passive/active) (IO2 or IO3)	U _N = DC 30 V U _M = AC 250 V
	Intrinsically safe output (flow switch)	U _o = ± 5.88 V I _o = 4.53 mA P _o = 6.6 mW C _o = 43 μ F L _o = 1.74 H

¹ Transient over-voltages according to Over Voltage Category II.

Application data	
Environmental temperature range	Storage (analyzer): -40 to 60 °C (-40 to 140 °F) Operation: -20 to 60 °C (-4 to 140 °F)
Environmental relative humidity	80 % to temperatures up to 31 °C (88 °F), decreasing linearly to 50 % at 40 °C (104 °F)
Environment: pollution degree	Rated Type 4X and IP66 for outdoor use and considered pollution degree 2 internally
Altitude	Up to 2000 m (6562 ft)
Measurement ranges (H ₂ O)	0 to 500 ppmv (0 to 24 lb/mm scf) 0 to 2000 ppmv (0 to 95 lb/mm scf) 0 to 6000 ppmv (0 to 284 lb/mm scf)
Sample cell operating pressure range	Application dependent 800 to 1200 mbara (standard) 800 to 1700 mbara (optional)
Sample cell tested pressure range	-25 to 689 kPag (-7.25 to 100 psig)
Sample process temperature	-20 to 60 °C (-4 to 140 °F)
Sample flow rate	0.5 to 1.0 SLPM (1 to 2 SCFH)
Process seal	Dual seal without annunciation
Primary process seal 1 ²	SCHOTT NG11 glass Sealant: Master Bond EP41S-5
Primary process seal 2 ²	Primary process seal 2 Material: alumina ceramic
Secondary process seal ²	Elastosil RT 622
Area classification	
J22 TDLAS gas analyzer	Ex db ia [ia Ga] ib op is IIC T4 Gb Tambient = -20 to 60 °C
Ingress protection	Type 4X, IP66

2.8.1 J22 analyzer seals

The optical head of the analyzer interfaces with the process medium through a lens and pressure transducer in the cell tube assembly. The window and pressure transducer are considered to be the primary seals of the equipment. The ISEM interface module assembly provides separation between the transmitter head and optical head, which is considered to be the analyzer's secondary seal. Although the J22 contains other seals to prevent the migration of process medium into the electrical wiring system, if either of the primary seals fail, only the ISEM interface module assembly is considered a secondary seal.

The J22 analyzer transmitter housing is certified for Zone 1 with a factory-sealed terminal compartment which eliminates the need for external seals. The factory seal is only required when used in -40 °C (-40 °F) or lower ambient temperatures.

All optical heads for J22 analyzer systems were assessed as "dual seal without annunciation" devices. Refer to the markings on the label for the maximum working pressures.

² See [J22 analyzer seals](#) → .

2.8.2 Electrostatic discharge

The coating and the adhesive label is non-conducting and may generate an ignition capable level of electrostatic discharge under certain extreme conditions. The user should ensure that the equipment is not installed in a location where it may be subjected to external conditions, such as high pressure steam, which may cause a build-up of electrostatic charges on non-conducting surfaces. To clean the equipment, use only a damp cloth.

2.8.3 Chemical compatibility

Never use vinyl acetate or acetone or other organic solvents to clean the analyzer housing or labels.

3 Installation

⚠ CAUTION

The safety of the analyzer is the responsibility of the installer and the organization they represent.

- ▶ Use appropriate protective safety equipment as recommended by local safety codes and practices, such as hard hat, steel-toe shoes, or gloves. Exercise caution, particularly when installing equipment at a height (≥ 1 m above ground).

3.1 Lifting and moving the analyzer

The analyzer should be lifted and moved by a minimum of two individuals. Support the analyzer by placing your hands beneath the controller or cell tube. Never lift the analyzer by the cable glands, cables, or tubing connections.

3.2 Mounting the analyzer

Mounting the J22 is based on the style of analyzer. When ordered without a sample conditioning system, the J22 may be specified with an optional enclosure mounting plate or wall mount bracket for installation.

When mounting the analyzer, be sure to position the instrument so that it is not difficult to operate adjacent devices. Refer to the layout diagrams mounting dimensions and additional instructions in the *J22 TDLAS gas analyzer Operating Instructions (BA02152C)*.

NOTICE

Hardware used for mounting the J22 TDLAS gas analyzer must be able to support four times the weight of the instrument. The J22 analyzer weighs approximately 16 kg (36 lb).

3.2.1 Enclosure mounting

The mounting plate option is designed for users who will install the J22 analyzer onto their own enclosure. The J22 should be installed vertically with the analyzer controller exposed to the exterior of the enclosure.

Hardware supplied

- Machine screws and nuts for analyzer mounting
- O-ring for analyzer seal (captive into the plate)

To install the J22 onto an enclosure

1. Refer to the enclosure mounting dimensions below to provide a proper cutout in the user-supplied enclosure.

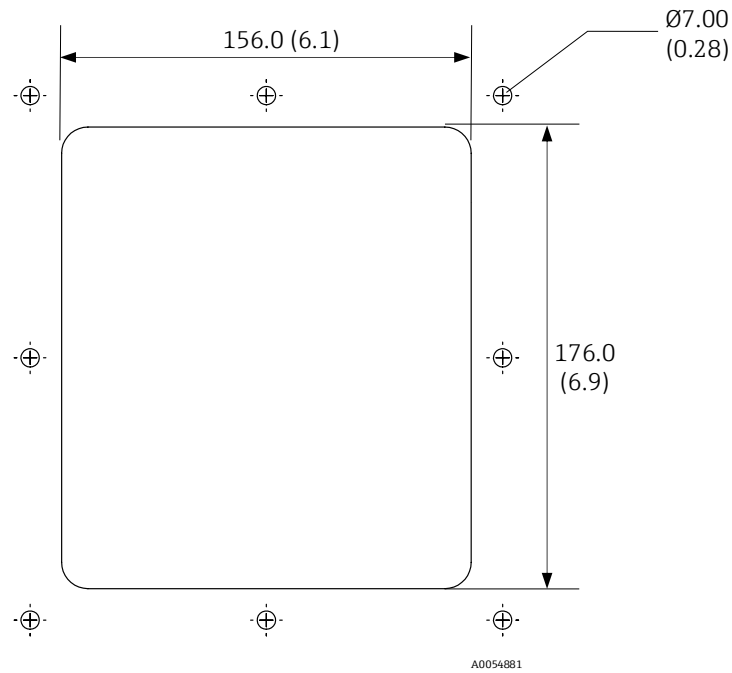


Figure 2: Enclosure mounting cutout. Dimensions: mm (in)

2. Lower the analyzer through the enclosure hole so the plate aligns with the gasket. Ensure the o-ring is still seated in its groove before lowering the analyzer into the enclosure.
3. Secure the analyzer in place with eight M6 x 1.0 screws and corresponding nuts. Tighten to a minimum 13 N-m (115 lb-in).

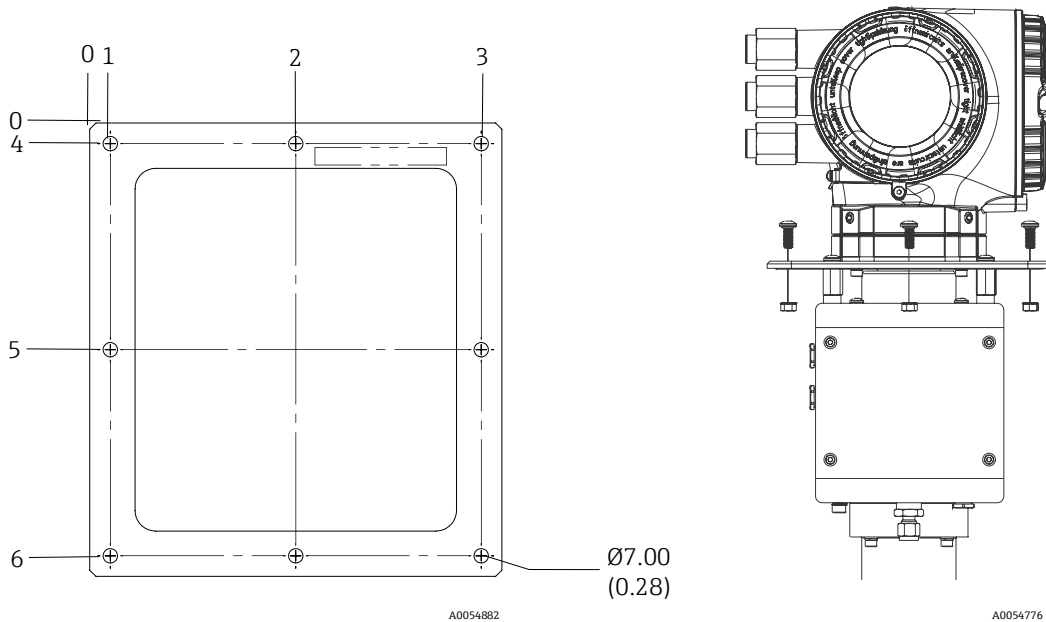


Figure 3: Enclosure mounting plate and hardware. Engineering units: mm (in)

Distance to hole. Engineering units: mm (in)					
From corner 0			From corner 0		
1	2	3	4	5	6
10.0 (0.39)	100.0 (3.94)	190.0 (7.48)	10.0 (0.39)	110.0 (4.33)	210.0 (8.27)

3.2.2 Wall mounting

For users installing the analyzer with the wall mount bracket, refer to the mounting dimensions below. M8 panel mounting studs, bolts, and screws are not supplied. Hardware used for mounting the J22 TDLAS gas analyzer must be able to support four times the weight of the equipment.

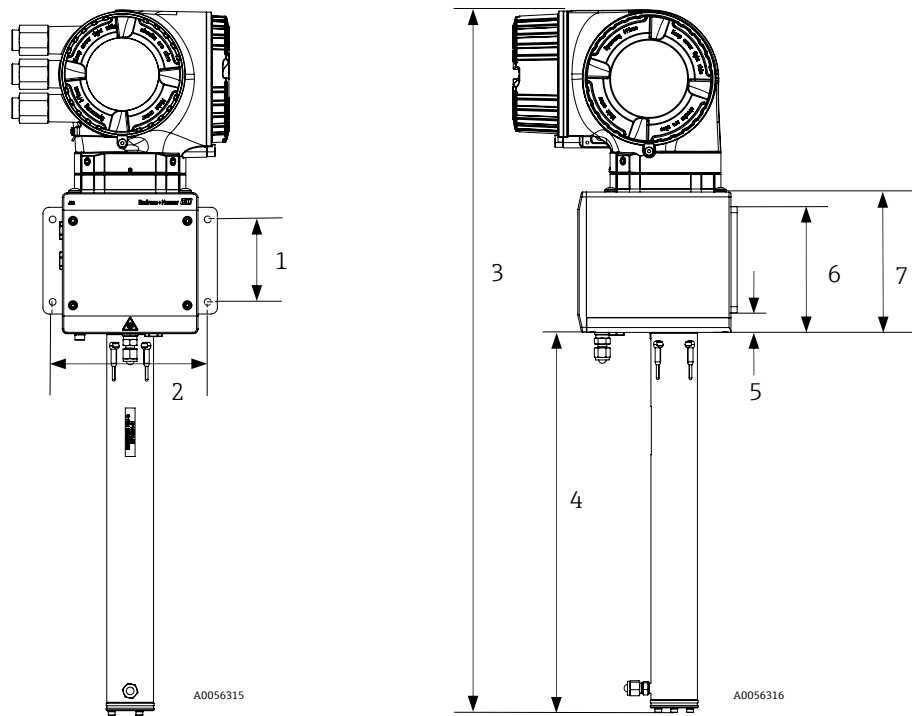


Figure 4: Wall mounting dimensions

#	Distance between bracket holes mm (in)
1	85.0 (3.3)
2	160.0 (6.3)

#	Dimensions mm (in)
3	727.3 (28.6)
4	393.4 (15.5)
5	20.2 (0.8)
6	130.2 (5.1)
7	145.2 (5.7)

3.3 Opening/closing the analyzer enclosure

⚠ WARNING

Hazardous voltage and risk of electric shock.

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

Only open the analyzer covers when the following conditions are met:

- The power is off.
- The equipment is installed in a nonhazardous area.

Before putting the covers back on the analyzer, perform a visual inspection to ensure the degree of protection was not compromised.

- The seal must be flat, with no bends in the seal surface.
- The cover's thread must be uniform, free of debris, and greased.

3.4 Protective chassis and ground connections

Before connecting any electrical signal or power, the protective and chassis grounds must be connected.

- Protective and chassis grounds must be of equal or greater size than any other current-carrying conductors.
- Protective and chassis grounds are to remain connected until all other wiring is removed.
- Protective grounding wire current carrying capacity must be at minimum the same as the main supply.
- Equipotential bonding connection must be at least 6 mm² (10 AWG).

3.4.1 Protective ground cable

- Analyzer: 2.1 mm² (14 AWG)
- Enclosure: 6 mm² (10 AWG)

The grounding impedance must be less than 1 Ω.

3.4.2 Electrical connections

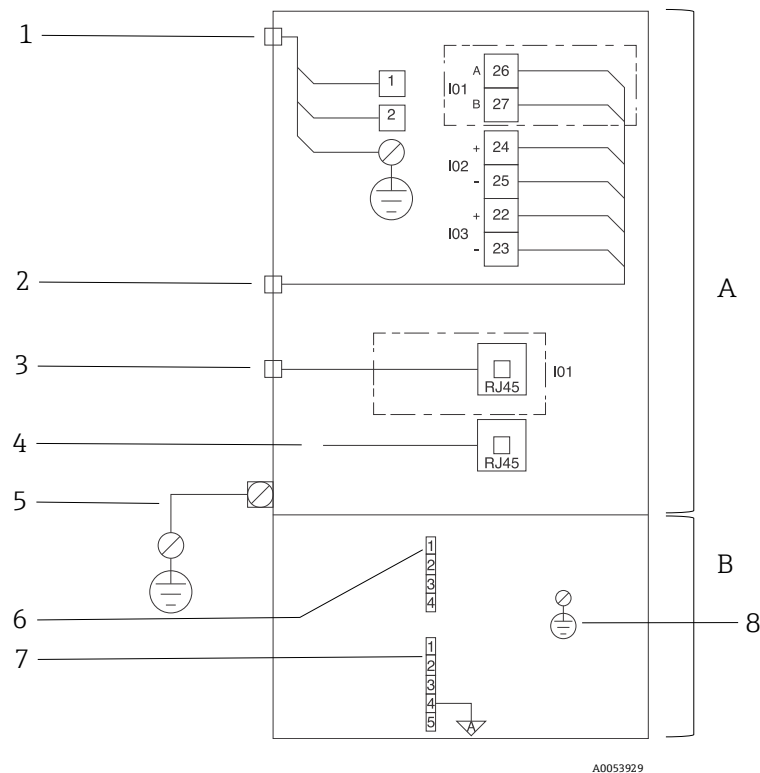



Figure 5: J22 analyzer electrical connections

#	Description
J22 controller (A)	
1	AC 100 to 240 V ±10 %; DC 24 V ±20 % 1 = line; 2 = neutral Wire is 14 gauge or larger for ground connection (for line, neutral and ground). Cross section of the cable is ≥ 2.1 mm ² .
2	Data ports I/O options: <ul style="list-style-type: none"> ▪ Modbus RTU ▪ Outputs: Current, Status, Relay ▪ Inputs: Current, Status Terminals 26 and 27 are used for Modbus RTU (RS485) only.
3	Alternative data port 10/100 Ethernet (optional), network option Modbus TCP Terminals 26 and 27 are replaced by an RJ45 connector for Modbus TCP.
4	Service port Internal connection is accessible only temporarily by trained personnel for test, repair, or overhaul of the equipment, and only if the area where the equipment is installed is known to be nonhazardous.

#	Description
5	External ground lug Must be 10 gauge or larger. Cross section of the cable is $\geq 6 \text{ mm}^2$.
Optical head (B)	
6	Flow switch connection (1 to 4) = connector J6. See drawing EX2900000010-00. 1 = flow switch line 2 = analog ground 3 = no connection 4 = no connection
7	RS485 MAC communication lines (1 to 5) = connector J7. See drawing EX2900000010-00. Connector J7 is for Endress+Hauser factory connection only. Do not use for installation or customer connection. 1 = negative intrinsically safe line 2 = positive intrinsically safe line 3 = no connection 4 = connection to the analog ground on the optical head enclosure (OHE) and to the RS485 harness shielding 5 = no connection
8	Internal ground to optical head cover

3.5 Electrical wiring requirements

For additional information refer to the electrical parameters in *Analyzer technical specifications* → .

NOTICE

The installer is responsible for complying with all local installation codes.

- ▶ Field wiring (power and signal) must be accomplished using wiring methods approved for hazardous locations as per IEC 60079-14.
- ▶ Use copper conductors only.
- ▶ The minimum length of the cable must exceed 3 m (9.8 ft).

3.5.1 Wire temperature rating and torque

- Temperature: -40 to $105 \text{ }^\circ\text{C}$ (-40 to $221 \text{ }^\circ\text{F}$)
- Terminal block screw torque: 1.2 Nm (10 lbf-in)

3.5.2 Cable entries

After installing all interconnecting wiring or cabling, make sure any remaining conduit or cable entries are plugged with certified accessories according to the intended use of the product.

Thread lubricant must be applied on all conduit hub threaded connections. Using Syntheses Glep1 or equivalent lubricant on all conduit screw thread is recommended.

NOTICE

Conduit seals and glands specific to the application should be used where appropriate in compliance with local regulations.

3.5.3 Threaded entries

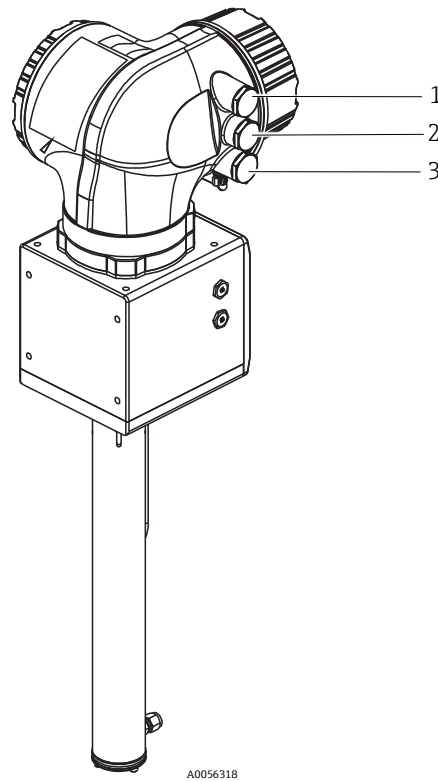


Figure 6: Threaded entries (with plugs) on IECEx/PESO J22 analyzer

Cable entry	Description	IECEX
1	Controller power	M20 x 1.5
2	Modbus output	M20 x 1.5
3	2 Configurable I/O	M20 x 1.5

3.5.4 Cable type

The standard ANSI/TIA/EIA-568-B.2 Annex specifies CAT 5 as the minimum used for Ethernet/IP. CAT 5e and CAT 6 are recommended.

3.5.5 Conditions of use

Installation must be in accordance with IEC 60079-14.

The temperature of the equipment's transmitter can reach 67 °C (153 °F) in a 60 °C (140 °F) ambient at the cable entry and the branching point. This must be considered by the user when selecting field wiring and cable entry devices.

3.6 Connection values: signal circuits

3.6.1 Terminal assignment

Input supply voltage		Input/output 1		Input/output 2		Input/output 3	
1 (+)	2 (-)	26 (B)	27 (A)	24 (+)	25 (-)	22 (+)	23 (-)
		Modbus RS485 only ³		Device-specific terminal assignment: refer to adhesive label on terminal cover			

3.6.2 Safety-related values

Refer to the *Analyzer technical specifications* → .

3.6.3 Modbus interface cable specification

Cable type	A
Characteristic impedance	135 to 165Ω at a measuring frequency of 3 to 20 MHz
Cable capacitance	< 30 pF/m
Wire cross-section	> 0.34 mm ² (22 AWG)
Cable type	Twisted pairs
Loop resistance	≤ 110 Ω/km

3.7 Electrical circuit breakers

The main electronic assembly must be protected by an overcurrent protection rated for 10 A or less.

NOTICE

The breaker must not interrupt the protective earth conductor.

- ▶ If the breaker in the customer-provided power distribution panel or switch is the primary means of disconnecting the power from the analyzer, locate the analyzer so that the power distribution panel is in close proximity to the equipment and within easy reach of the operator.

3.8 Connecting the gas supply

The illustration below shows the sample gas inlet and outlet for the J22 TDLAS gas analyzer. Refer to the *J22 TDLAS gas analyzer Operating Instructions (BA02152C)* for detailed instructions on gas sample conditioning and final installation directions. All work must be performed by technicians qualified in pneumatic tubing.

WARNING

Process samples may contain hazardous material in potentially flammable or toxic concentrations.

- ▶ Personnel should have a thorough knowledge and understanding of the physical properties and safety precautions for the sample contents before connecting the gas supply.

³ Terminals 26 and 27 are replaced by an RJ45 connector for Modbus TCP/IP.

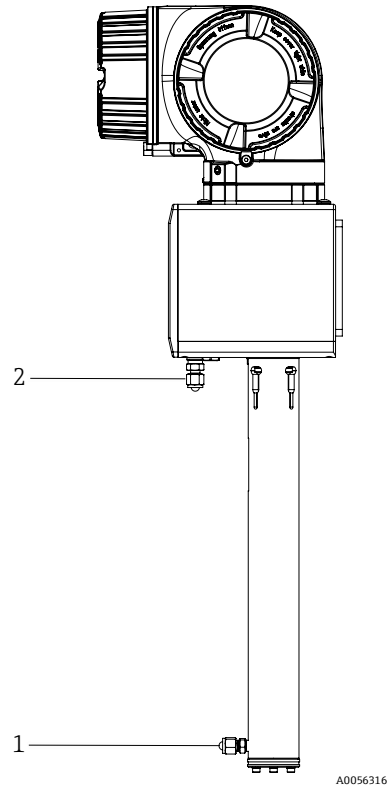


Figure 7: Sample gas inlet and outlet

#	Description
1	Sample inlet (1/4" or 6 mm tubing connector as defined by order code) Do not exceed 0.7 barg (10 psig)
2	Sample outlet

4 Equipment operation

⚠ CAUTION

- ▶ The safety of the analyzer is the responsibility of the installer and the organization they represent.
- ▶ Hardware used for mounting the J22 TDLAS gas analyzer must be able to support four times the weight of the instrument. The J22 analyzer weighs approximately 16 kg (36 lb).

4.1 Operating controls

The J22 is operated using the optical touch pad. Basic operating parameters are provided in the *J22 TDLAS gas analyzer Operating Instructions (BA02152C)*.

4.2 Commissioning

1. Power the system on.
2. Set flow rates and pressure for the system as specified in the system drawings provided in the *J22 TDLAS gas analyzer Operating Instructions (BA02152C)*.
3. Ensure the sample vent has an unrestricted connection to atmosphere or flare, as specified.

NOTICE

- ▶ The temperature of the process medium must be within the ambient temperature rating of the equipment.
- ▶ Do not exceed the specified pressure setting or equipment damage may occur.

4.3 Decommissioning


4.3.1 Intermittent operation

If the analyzer will be stored or shut down for a short time period, follow the instructions for isolating the measurement cell.

1. Purge the system:
 - a. Shut off the process gas flow.
 - b. Allow all residual gas to dissipate from the lines.
 - c. Connect a nitrogen (N₂) purge supply, regulated to the specified sample supply pressure, to the sample supply port.
 - d. Confirm that any valves controlling the sample flow effluent to the low pressure flare or atmospheric vent are open.
 - e. Turn on the purge supply to purge the system and clear any residual process gases.
 - f. Turn off the purge supply.
 - g. Allow all residual gas to dissipate from the lines.
 - h. Close all valves controlling the sample flow effluent to the low pressure flare or atmospheric vent.
2. Disconnect electrical connections to the system:
 - a. Disconnect power to the system.

⚠ CAUTION

- ▶ Confirm the power source is disconnected at the switch or circuit breaker. Make sure the switch or breaker is in the “OFF” position and locked with a padlock.
- b. Confirm all digital/analog signals are turned off at the location from which they are being monitored.
 - c. Disconnect the phase and neutral wires from the analyzer.
 - d. Disconnect the protective ground wire from the analyzer system.
3. Disconnect all tubing and signal connections.
 4. Cap all inlets and outlets to prevent foreign material such as dust or water from entering the system.
 5. Ensure the analyzer is free from dust, oils or any foreign material. Follow instructions found in “To clean the J22 exterior”.

6. Pack the equipment in the original packaging in which it was shipped, if available. If the original packaging material is no longer available, the equipment should be adequately secured (to prevent excessive shock or vibration).
7. If returning the analyzer to the factory, complete the decontamination form provided by Endress+Hauser and attach to the outside of the shipping package as instructed before shipping. Refer to *Service* → .

5 Maintenance and service

Any repairs carried out by the customer or on behalf of the customer must be recorded in a site dossier and kept available for inspectors. For more information on system repairs and replacements, refer to the *J22 TDLAS gas analyzer Operating Instructions (BA02152C)*

WARNING

Process samples may contain hazardous material in potentially flammable or toxic concentrations.

- ▶ Personnel should have a thorough knowledge and understanding of the physical properties and safety precautions for the sample contents before connecting the gas supply.

5.1 Cleaning and decontamination

To clean the J22 exterior

The housing should be cleaned only with a damp cloth to avoid electrostatic discharge.

NOTICE

- ▶ Never use vinyl acetate, acetone or other organic solvents to clean the analyzer housing or labels.


5.2 Troubleshooting and repairs

5.2.1 Cleaning the cell mirror

If contamination makes its way into the cell and accumulates on the internal optics, a **DC spectrum power range exceeded** fault results.

When determining whether to perform this task, carefully review the notices and warnings below.

NOTICE

- ▶ Cell assembly mirror cleaning should only be performed when there is a small amount of contamination. Otherwise, refer to *Service* → .
- ▶ Careful marking of the mirror orientation is critical to restoring system performance upon reassembly after cleaning.
- ▶ Always handle the optical assembly by the edge of the mount. Never touch coated surfaces of the mirror.
- ▶ Pressurized gas duster products are not recommended for cleaning components. The propellant may deposit liquid droplets onto the optic surface.
- ▶ Never rub an optical surface, especially with dry tissues, because this can mar or scratch the coated surface.
- ▶ This procedure should be used **ONLY** when necessary and is not part of routine maintenance.

WARNING

INVISIBLE LASER RADIATION: The sample cell assembly contains a low power, 35 mW maximum, CW Class 3B invisible laser with a wavelength between 750 to 3000 nm.

- ▶ Never open the sample cell flanges or the optical assembly unless the power is turned off.

WARNING

Process samples may contain hazardous material in potentially flammable 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 equipment.
- ▶ All valves, regulators, and switches should be operated in accordance with site lockout/tagout procedures.

The procedure for cleaning the cell assembly mirror is broken into 3 parts:

- Purging the measurement cell and removing the mirror assembly
- Cleaning the cell assembly mirror
- Replacing the mirror assembly and components

Tools and materials

- Lens cleaning cloth (Cole-Parmer® EW-33677-00 Texwipe TX1009 Low-Particulate Wipes or equivalent)
- Reagent-grade isopropyl alcohol (Cole-Parmer® EW-88361-80 or equivalent)
- Small drop dispenser bottle (Nalgene® FEP drop-dispenser bottle or equivalent)
- Acetone-impenetrable gloves (Honeywell North CE412W Chemsoft Nitrile gloves or equivalent)
- Hemostat (Fisherbrand™ 13-812-24 Rochester-Pean Serrated Forceps or equivalent)
- Bulb blower or dry compressed air/nitrogen
- Torque wrench
- Permanent ink marker
- 3 mm hex driver
- Non-outgassing grease
- Flashlight

To purge the measurement cell and remove the mirror assembly

1. Power down the analyzer.
2. If possible, purge the system with nitrogen for 10 minutes.
3. Carefully mark the orientation of the mirror assembly with a permanent ink marker on the cell body.
4. Gently remove the mirror assembly from the cell using a 3 mm hex driver to remove the socket head cap screws. Set the mirror assembly on a clean, stable, flat surface.

To clean the cell assembly mirror

1. Using a bulb blower or dry compressed air/nitrogen, remove dust and other large particles of debris.
2. Put on clean acetone-impenetrable gloves.
3. Double-fold a clean sheet of lens cleaning cloth. Using hemostats or your fingers, clamp near and along the fold to form a “brush.”
4. Place a few drops of isopropyl alcohol onto the mirror and rotate the mirror to spread the liquid evenly across the mirror surface.
5. With gentle, uniform pressure, wipe the mirror from one edge to the other with the cleaning cloth only once and only in one direction to remove the contamination. Discard the cloth.
6. Repeat with a clean sheet of lens cleaning cloth to remove the streak left by the first wipe.
7. Repeat Step 6, if necessary, until there is no visible contamination on the mirror.

To replace the mirror assembly and components

1. Carefully replace the mirror assembly onto the cell in the same orientation as previously marked.
2. Add a very thin layer of non-outgassing grease to the O-ring.
3. Replace the O-ring and ensure it is properly seated.
4. Tighten the socket head cap screws evenly with a torque wrench to 2.6 Nm (23 lb-in).
5. Restart the analyzer.

5.2.2 Repair verification

When repairs have been completed correctly, alarms will clear from the system.

⚠ CAUTION

Residual risk. Some capacitors may remain charged with high voltage in the case of a single fault.

- ▶ Allow 10 minutes before controller covers are opened.

5.2.3 Power termination covers

Confirm the termination cover is closed before initiating operation or after a repair event. Should the cover become damaged, it must be replaced to avoid potential safety risk.

5.3 Spare parts

All spare parts for the analyzer, along with their order codes, are listed in the spare parts finder tool on the Endress+Hauser website.

Spare parts finder tool: www.endress.com/product-tools

5.4 Service

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

Before contacting service, prepare the following information to send with your inquiry:

- Analyzer serial number (SN)
- Contact information
- Description of the problem or questions

Access to the information above will expedite the response to technical requests.

www.addresses.endress.com
