

General Specifications

TDLS5500 High Sensitivity Laser Spectrometer

GS 11Y01B04-01EN

[Style: S2]

■ General

TDLS5500 is a computerized device that measures the amount of gas contained in the process in real time. Gases are measured in parts per million (ppm by volume) or in milligrams per normal cubic meter (mg/Nm^3) in the sample. The sampling of the gas is continuously performed by being pumped. In this manner, the sampled gas is continuously analyzed. The sampling is done continuously by pumping through a calibrated hole called sonic nozzle. Once the nozzle is passed, the gas is expanded to reach a pressure well below atmospheric pressure. This is Low Pressure Sampling (LPS). The sampled gas is guided to a low volume measuring tank: cell for analysis. The analysis is performed by infrared laser spectroscopy, OFCEAS (Optical Feedback Cavity Enhanced Absorption Spectroscopy).



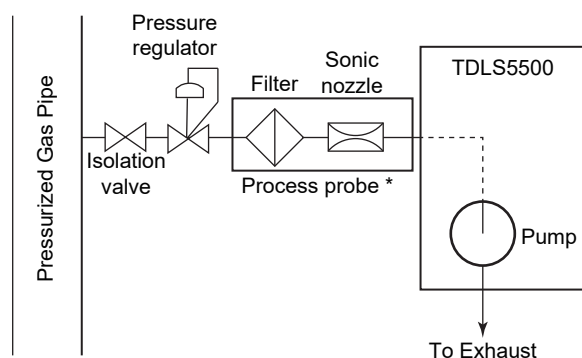
■ Applications

- Acetylene in ethylene
- Hydrogen sulfide in Natural gas
- Moisture in Natural gas

■ Features

- The optical resonator structure makes the effective path length long (up to 30 km) and realizes ultra-high sensitivity.
- Low pressure sampling
 - The interactions within the gas are reduced. This has a direct effect on the shape of the absorption peaks. It is thus easier to distinguish the different peaks and allow a very good selectivity. This eliminates the effects of cross-sensitivity and false positives.

■ System configuration



*: The process probe is part of the product.

TDLS is a trademark of Yokogawa Electric Corporation.

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■ Standard Specifications

Measurement object:

C₂H₂ concentration in Ethylene,
H₂S concentration in Natural gas, or
H₂O concentration in Natural gas

If other gas measurements are required, consult with Yokogawa.

Measurement performance

Measured components and ranges:

Measured component	Min. range	Max. range
C ₂ H ₂ in Ethylene	0-5 ppm	0-5000 ppm
H ₂ S in Natural gas	0-5 ppm	0-1000 ppm
H ₂ O in Natural gas	0-5 ppm	0-100 ppm

Please consult with Yokogawa if the measuring range for your sample gas is outside of the above ranges.

Measured gas	Measurement range			Repeatability	Linearity	Response time (T10-T90)
	Range type	Suffix Code	Max.			
C ₂ H ₂ in Ethylene	Low range	-T1	100 ppm	±2 % of reading or ±50ppb, whichever is greater	R ² >0.99	within. 20 sec.
	High range	-T2	5,000 ppm	±2 % of reading or ± 1 ppm, whichever is greater		
H ₂ S in Natural gas	Low range	-S1	100 ppm	±2 % of reading or ±100ppb, whichever is greater	R ² >0.99	within. 10 sec.
	High range	-S2	1,000 ppm	±2 % of reading or ±100ppb, whichever is greater		
H ₂ O in Natural gas	Low range	-H1	100 ppm	±2 % of reading or ±100ppb, whichever is greater	R ² >0.99	within. 30 sec.

Response time depends on the gas and the configuration, particularly from the length of the transfer line.

Environment

Ambient operating temperature: 10 to 40°C
Storage temperature: -10 to 60°C
Relative humidity range: 10 to 90% non-condensing
Pressure: 700 mbar to 1,300 mbar absolute.
Installation requirements: Vibration-free

Power supply

Power supply rating: 100 to 240 VAC +/-10%, 48-62 Hz
Power consumption: 500 W (max)

Signal Output

Analog output: 4-20 mA
Load resistance 600 Ω (max)
Dry contact output: 5 points
Contact rating 24 VDC, 1A
Contact Specification: C-contact
(COM/NO or COM/NC)

Modbus TCP/IP

Mechanical and others

Protection degree: IP54
Mounting: Indoor wall mount
Case material: Stainless steel
Display: 5.7" diagonal color screen
Weight: 40 kg

Sampling gas condition

Sampling pressure: 1 to 5 bar gauge
 Sampling flow rate: 60 L/h (max)
 Sampling Gas Temperature:
 80°C (max) non-condensation or non-freezing
 Exhaust: 0.2 bar gauge (max)
 Dust: Basically dust free

Pressurization gas connections

Inlet pressure: 5 to 7 bar (4 to 6 bar gauge)
 Pursing flow rate: 5 Nm³/h (min)
 Purging time: 16 minutes (min)
 Dust: dust free
 Overpressure: 0.9 to 3 mbar
 Leakage flow rate: 2 Nm³/h (max)
 Note: The certification is valid for air pressurization only.

Containment system

Inlet pressure: 5 bar (4 bar gauge)
 Flow rate: 60 L/h (max)

Regulatory

Safety conformity standards:
 CE EN61010-1, EN IEC 61010-2-030, EN 61010-2-010
 Installation altitude: 2000 m or less
 Installation category: II
 Pollution degree: 2
 Note: Installation category, called overvoltage category, specifies impulse withstand voltage. Pollution degree indicates the degree of existence of solid, liquid, gas or other inclusions which may reduce dielectric strength.

EMC conformity standards:
 EN 55011 Class A Group 1
 EN 61326-1 Class A Table 2,
 EN 61326-2-3,
 EN 61000-3-2, EN 61000-3-3

* For Class A equipment

RoHS conformity standards: EN IEC 63000

REACH conformity standard:
 Regulation EC 1907/2006

Laser classification:
 EN60825-1:2014, Class 1 laser product

* If you need to open the optical box, laser input can be up to 3B class. Safety optical laser glasses MUST be worn.

Hazardous area classifications

ATEX Type of protection:
 II 2G Ex pxb IIC T3 Gb
 Enclosure rating:
 IP4X (In accordance with EN 60529)
 Applicable standards:
 ATEX Directive 2014/34/UE, Standards EN 60079-0:2018
 EN 60079-2:2014
 IECEx Type of protection:
 Ex pxb IIC T3 Gb
 Enclosure rating:
 IP4X
 Applicable standards:
 IEC 60079-0:2017
 IEC 60079-2:2014

■ MODEL AND CODES

[Style: S2]

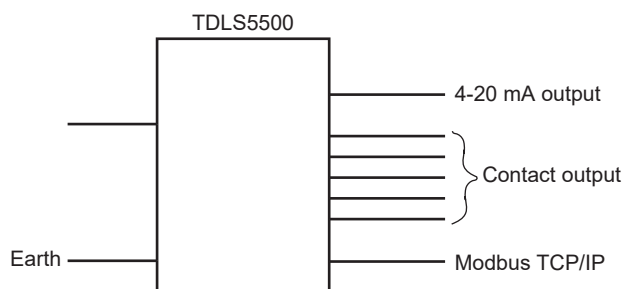
Model	Suffix Code	Option Code	Description
TDLS5500			High Sensitivity Laser Spectrometer
Type	-S2		IECEX, ATEX Pressurized enclosure "px"
Gas Parameter	-T1 -T2 -S1 -S2 -H1		C ₂ H ₂ in Ethylene: 0-5 ppm / 0-100 ppm C ₂ H ₂ in Ethylene: 0-5000 ppm H ₂ S in Natural Gas: 0-5 ppm / 0-100 ppm H ₂ S in Natural Gas: 0-1000 ppm H ₂ O in Natural Gas: 0-5 ppm / 0-100 ppm
Process Probe	-P1 -P2		(for C ₂ H ₂ and H ₂ S) OD 1/4 inch, 100 μm nozzle + 2 μm Filter (for H ₂ O) OD 1/4 inch, 150 μm nozzle + 2 μm Filter
Power Supply	-03		100VAC to 240VAC
—	-NN		Always -NN
—	-NN		Always -NN

● Standard Accessories

Parts Name	Qty	Description
Pump maintenance kit	1	2x membranes viton, 4x clapets viton, 4x joints (o-rings)
Process Probe	2*	OD 1/4 inch, 100 μm nozzle + 2 μm filter, or OD 1/4 inch, 150 μm nozzle + 2 μm filter
SS Nut Fitting OD 1/4	4	SS Nut 1/4 for tube fitting
Ferrules set OD1/4	4	SS Set of rings for 1/4 tube fitting (Front ferrule and back ferrule)
Mounting bracket	4	For wall mount
Key of enclosure	1	used to open the door

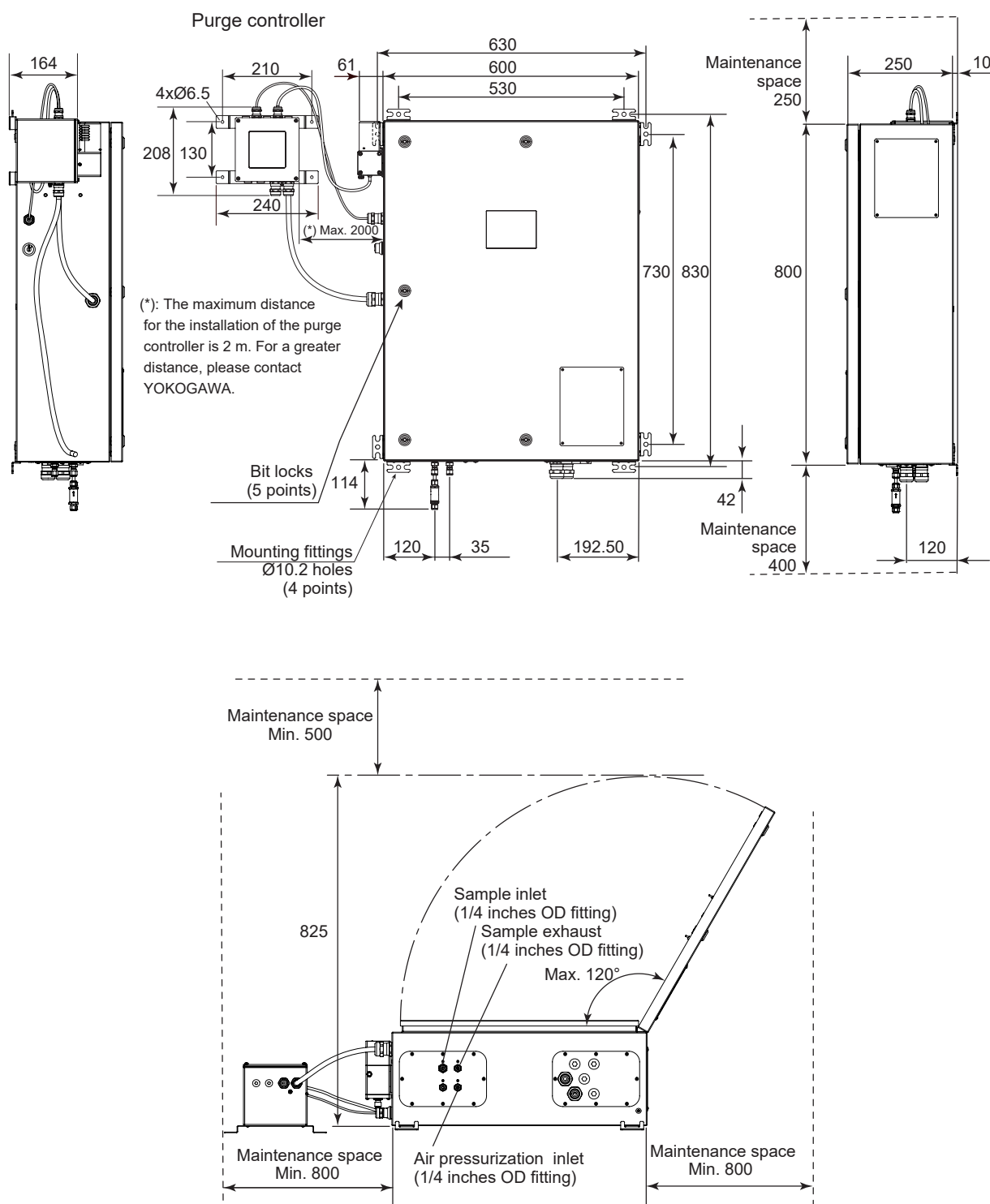
*: 2 sets including one spare part

■ WIRING



EXTERNAL DIMENSIONS

Unit: mm



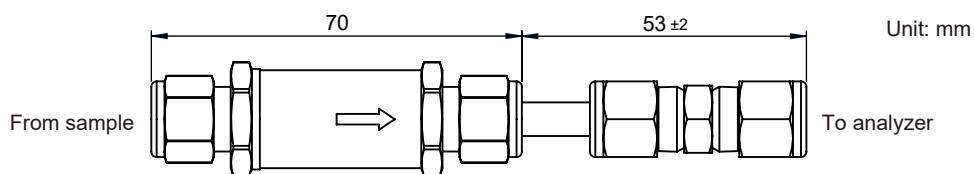
- **Process probe**

The process probe is part of the product and consists of a sonic nozzle and a filter. It must be connected to the cabinet sample inlet fitting A.

– the sonic nozzle is a 1/4" outer diameter, with a small pinhole of 100 μm or 150 μm .

– the filter is generally a 2 μm sintered stainless steel in-line filter.

Material: 316L Stainless Steel



TDL5500 High Sensitivity Laser Spectrometer Inquiry Form

Thank you for your inquiry about our TDL5500 Highly Sensitive Laser Gas Analyzer. Please make inquiries by placing checkmarks in the appropriate boxes and filling in the blanks.

1. General Information

Name : _____
 Company : _____
 Address : _____
 Phone # : _____
 Fax # : _____
 E-mail # : _____

Request reference

Requested delivery date (day/month/year) : _____

Plant name / Project name : _____

Type : ☐ New installation ☐ Replacement / revamping

Brief Description of Application : _____

End user name : _____

Country of Installation : _____

2. Installation Details

Application	☐ H ₂ S in Natural Gas / ☐ H ₂ O in Natural Gas / ☐ H ₂ O in Hydrocarbon / ☐ C ₂ H ₂ in Ethylene ☐ other ()							
	Description:							
Stream Composition	Gas	Unit	Normal	Min.	Max.	Measurement Range	LoD	Response time max

		Unit	Normal	Min.	Max.
Sample data	Temperature				
	Pressure				
	Particulate Concentration				
	Flow Rate or available volume				
	Water content (% v/v preferred)				

Hazardous Classification	If the protection will be: ☐ II 2G Ex pxb IIC T3 Gb or Ex pxb IIC T3 Gb type protection : P ☐ Other ()				
power supply requirement	Power Supply	☐ 100 to 240VAC			
Data Output Requirement	Digital Output Modbus	TCP/IP			
	Analog Output	4-20 mA			
	Relay Output	5 dry contact (Alarm, General default, Maintenance)			

General Application & Installation Notes/Comments	
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Specific services	☐ FAT
	☐ SAT
	☐ Calibration Certificate (Traceability certificate)
	☐ other ()