

The Process TDLS Solution

NEW FEATURES



TDLS 200

Tunable Diode Laser Spectroscopy (TDLS) Analyzer

Bulletin 11Y01B01-01E-A

www.yokogawa.com/an/index.htm

The first Tunable Diode Laser analyzer

INNOVATIVE

Our TruePeak Process Laser Analyzer uses a tunable diode laser and measures across an infrared absorbance region. This means you can make measurements in the most demanding applications (high dust, corrosive, aggressive) typically **without sample conditioning.**

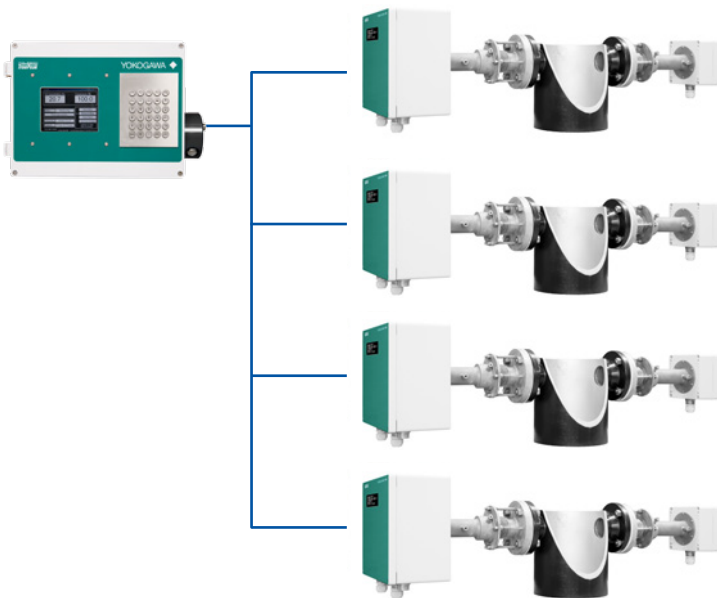
DEPENDABLE

TruePeak measurement ensures accuracy even during simultaneous sample pressure, temperature, and background gas changes.

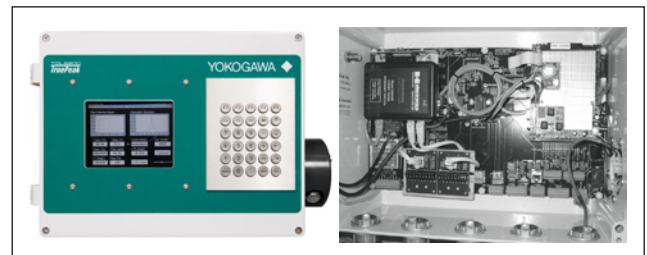
USER INTERFACE

▶ STAND ALONE

- Mini Display (integral or remote), 4x20 VFD with scrolling information
- 6.5" Color Screen with Keypad



REMOTE INTERFACE UNIT



Use with any type of analyzer, a separate wall mount enclosure with screen and keypad. Connects via Ethernet (VNC), up to 4 standard; 7 with internal switch; more with external switch. Requires 24 VDC input power

- Wall mount enclosure, IP65 (NEMA 4) powder coated aluminum
- Approx 460x330x180mm (18" w x 13" h x 7" d) weight 11.5kg (25lbs)
- Purged for ATEX CAT 2G or CAT 3G, CE, NEC Cl.1, BCD, Division 1 or 2
- Requires 23.8 - 24.5VDC Input power
- Integral keypad and 6.5" display
- Accepts 4 standard; 7 with internal switch; more with external switch
- Connection to Analyzer Unit via strike 8 pair; use CAT 5e cable.

TruePeak Virtual Analyzer Controller (VAC) software included, running Window XP embedded OS.

designed specifically for process analysis

ACCURATE

The TruePeak measurement integrates the area of the absorbance rather than measuring peak height or peak width value alone. This means you get a true **interference free** analysis.

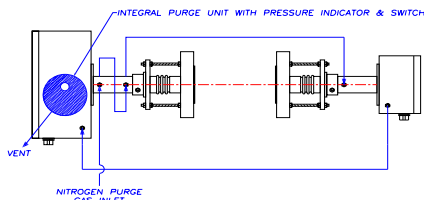
PROCESS HARDENED

Flexible installation options, materials of construction, and validation methods makes the Yokogawa TDL a perfect solution for the most aggressive process applications. A unique alignment method allows adjustment without compromising the process seal.

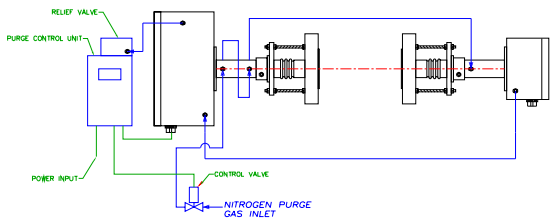
HAZARDOUS AREA

► NEC CLASS 1, DIV 2 GROUP B,C,D WHEN PURGED

- Suitable for Division 1 or 2 Installations with Purge System
- CSA/CSAu Special Acceptance Available



Analyzer for Division 2 Configuration



Analyzer for Division 1 Configuration

COMMUNICATIONS

► WIRED

- Analog Outputs (3, 4-20mA)
- Digital Outputs (Warning/Fault Relays + 3x Valve Control)
- Ethernet (standard)
- USB Data Transfer (standard)
- Other Options Available

RELIABILITY

► ENHANCED DIAGNOSTICS

Built In diagnostics with on board CPU, data storage, and retrieval. No PC required to record data, spectra, and critical diagnostics.

- Data transfer via Ethernet or memory stick
- Spectra capture (timed, manual capture, event-based)

► MAINTENANCE

- All components field repairable
- Remote diagnostics and analyzer control



Sample Diagnostics Screenshots

The Process TDLS Solution

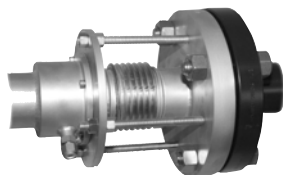
- ▶ In situ or extractive analysis
- ▶ Interference free for most applications
- ▶ TruePeak measurement
- ▶ Rapid measurement (as fast as 3 seconds)
- ▶ Process pressure up to 20 bar
- ▶ Process temperature up to 1500° Celsius
- ▶ Optical measurement - no sensor contact with process
- ▶ Flexible installation options
- ▶ Aggressive applications - high particulate, corrosives, and more



PROCESS INTERFACE

▶ TRUE PROCESS INTERFACE

Alignment without affecting the process seal is achieved by the use of a flexible bellows.



▶ OPTIONS

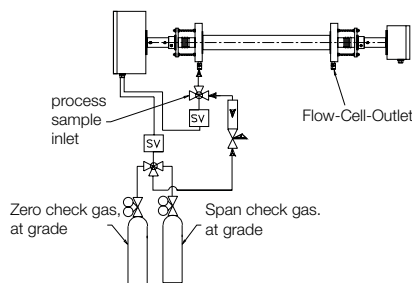
Windows, O-rings and wetted metal parts available for corrosive/lethal service. Insertion tubes to reduce path length for high particulate applications. Window purge protection for flow cell and in-situ applications available.

▶ LAYERS OF PROTECTION

Optional second window set provides seal, chamber behind process window, purge-able (can be monitored for breakthrough).

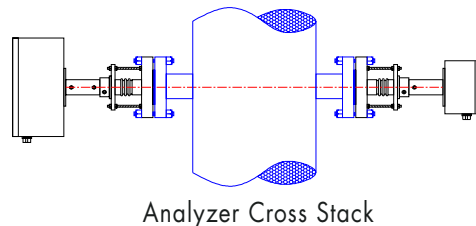
▶ EXTRACTIVE

Process sample is fully extracted from the process (and may be conditioned before measurement).



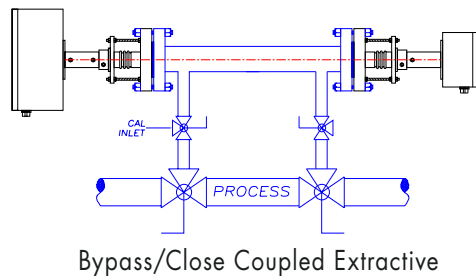
▶ IN SITU

Measurement across the process (stack or pipe)



▶ BYPASS

Process is diverted through a bypass line where analyzer is installed. Allows isolation of analyzer for verification, calibration, and maintenance.



▶ CLOSE COUPLED EXTRACTIVE

Process is extracted to a flow cell where analyzer is installed. Allows isolation of analyzer for verification, clarification, and maintenance.



COMBUSTION CONTROL

Ever increasing energy prices and the need to minimize harmful emissions require now more than ever that the combustion process needs to be fully optimized by controlling the air fuel ratio to ensure minimum energy use for maximum reward.

Measurement of excess oxygen and carbon monoxide on a precise and continuous basis is the recognized methodology. Tuneable diode lasers (TDLS) together with zirconia based O₂ analyzers enable a range of fast and accurate measurements of waste combustion gas for point or space average. Additionally, CO can for the first time be accurately measured on a continuous basis at low ppm levels using TDLS such that air fuel ratios can be precisely and continually optimized.

VALIDATION

▶ VALIDATION

Validation can be initiated manually, remotely, or automatically on a daily, weekly, bi-weekly, or monthly basis with time defined by the user.

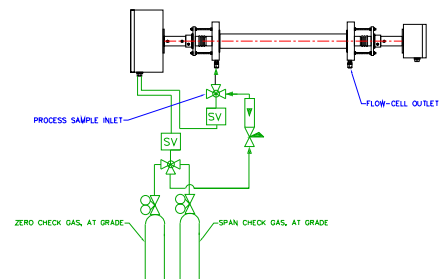
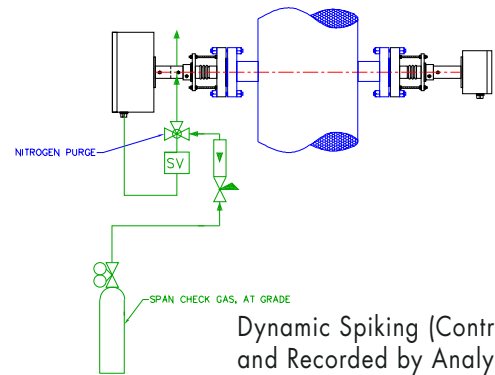
▶ AUTOMATED DYNAMIC SPIKING

With integral bump cell and analyzer driven valve control, on line validation can be performed using dynamic spiking. Gas standard and Nitrogen are alternately sent to the bump cell which is in series with the process gas being measured.

▶ OFF LINE

For cross stack/pipe installations, analyzer can be mounted on a calibration cell to check or calibrate zero and span.

For bypass or close coupled extractive installations, analyzer can be isolated from the process to check or calibrate zero and span. This process can be automatically controlled by the analyzer.



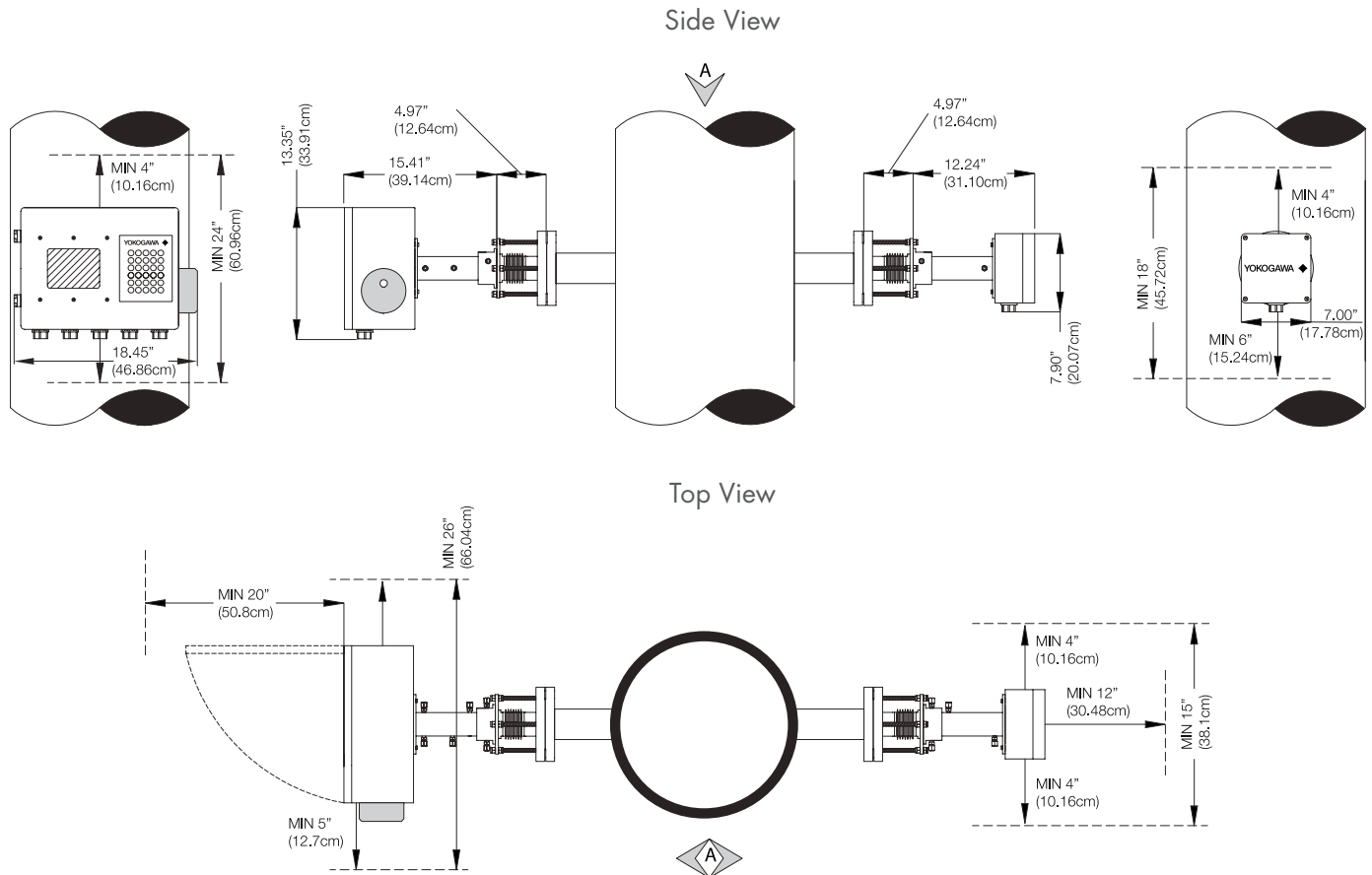


REFINERY

In addition to straightforward combustion control (where TDs can monitor in combustion chambers across multiple burners), laser based analyzers can now be offered (patent applied for) which monitor CO, CH₄ and O₂ to enable burner flame out and process tube leaks to be identified.

Additionally, O₂ on flare lines, Alkylation Units and Gas plant as well as CO and O₂ on FCCU's for safety and catalyst regeneration and low ppm H₂O in hydrocarbons in catalytic reforming are among many applications of these fast non contacting devices.

Dimensions



TECHNICAL SPECIFICATIONS

Path Length	0.5-30 meters
Response Time	2-20 seconds
Accuracy	Application Dependent
Linearity	R2=0.9999
Ambient Temperature	Continuous operation - 10°C to 50°C, start up temperature 0°C to 50°C. Extended temperature installation options are available please contact Yokogawa.
Analog I/O (optional)	Outputs: Concentration/Transmission (3@0/4-20mA isolated) Sub 4mA for warnings/faults Inputs: Pressure/Temperature Feed for Compensation (2@4-20mA isolated, powered or loop power)
Digital I/O	Outputs: •Warning/Fault/Concentration Limit Relays (3 Form C Relay SPDT rated 1A@24VDC) •Valve Control (3@24VDC, Max 10W per valve), zero/span/dynamic spiking Inputs: Remote Validation (3 voltage free floating contacts) for zero/span/dynamic spiking
Window Purge (if required)	Application Dependent (Contact Yokogawa)
Area Classification	Zone/Div 1/2 with purge
Communications	Ethernet, IEEE 802.3, 10/100 Mbps, RJ45 Automatic USB data transfer (upload/download settings and data)
Calibration	Recommended Calibration Check Interval 3-6 Months

GASES MEASURED

O₂	0.01% detection limit, Min Range 0-1%		<p>* Consult Yokogawa for ranges, other gas measurements possible. All detection limits for 1 meter path, 25°C, 1 bar.</p> <p>Consult representative for detection limits at other conditions</p>
H₂O (low/high)	0.2 ppm, Min Range 0-20ppm; ppm to % levels		
HCl	% Concentrations	contact Yokogawa	
CO (low/high)	low ppm range; high-ppm to % levels	contact Yokogawa	
CH₄	% Concentrations	contact Yokogawa	
CO₂	low ppm range	contact Yokogawa	
CO₂	high-ppm to % levels	contact Yokogawa	
CO + CO₂	dual gas, % concentrations	contact Yokogawa	
NH₃	Minimum Range 0-30 ppm	contact Yokogawa	
H₂S	High ppm to % level	contact Yokogawa	
Detection Limits, accuracy, etc. are application dependant.		Contact Yokogawa for more details	



New Features

TruePeak v3.0 Software

- Improved gas temperature measurement algorithm for High temperate Oxygen plus Temperature (-X3) analyzer.
 - Minimum measurable temperature can be configured.
 - If process temperature is lower than minimum measurable temperature, an analog input will be used so that O₂ reading is still valid.
- 4-20mA output block mode value can be configured by user
 - Applies to warning, fault, cal/val, entering menu.
- User may configure validation failure tolerance.
- User may configure alarm digital outputs delay (how many updates).
- User may configure the IP address much easier through TruePeak user interface.
- Two gas offline validation with one initiate. Example, O₂ safety analyzers.
- Two automatic online validations can be configured. Example automatic CO and CH₄ online validations
- Validation Failure Fault
- Validation alarms can be cleared through TruePeak user interface.
- Implement user selectable concentration reading during automatic online validation. The concentration reading can be calculated based on target gas absorption only in validation cell using validation cell parameters (length, temperature, pressure), or based on

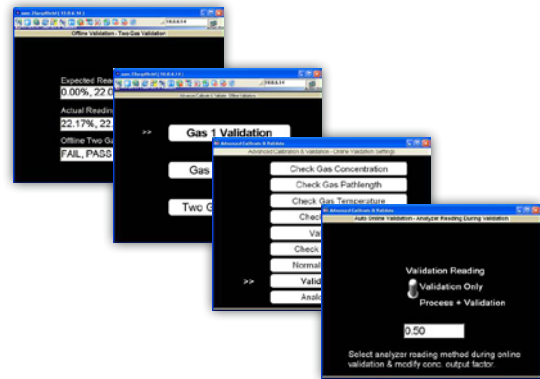
total target gas absorption in process and validation cell using process parameters. To avoid concentration reading outside measurement or AO range for "Validation Only" selection, a factor can be input for the final concentration reading. This factor can be a negative number for reverse online validation.

New main electronics

- Increased reliability and performance

New main processor

- Twice as fast as previous processor
- Wider operating temperature
- Protected XP Embedded image, improved shut down protection
- Twice as much memory as previous processor



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CLEARLY

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ACT
WITH AGILITY

VigilantPlant is Yokogawa's automation concept for safe, reliable, and profitable plant operations. VigilantPlant aims to enable an ongoing state of Operational Excellence where plant personnel are watchful and attentive, well-informed, and ready to take actions that optimize plant and business performance.

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