



T-LLA4810TP-H2O Series Laser Spectrometer

Process Liquid Moisture Analyzer

Ref: T_LLA4810_H2O_IntE
Revision:2004-09-1

Applicable to liquid sample

- Rugged industrial design, real time measurement
- Continuously in situ monitoring, No Liquid sampling
- High selectivity by spectroscopy optimization, free from interference of other Liquids
- High accuracy, non online calibration needed
- Adjustable measuring range
- Selectable output signals
- Easy installation
- Built-in calibration routines
- Dust on optical windows has less influence
- TAR type supports 1 to 3 Liquid analysis.
- Series structure suit to varies device and arts
- Enhancement modules support the system from single beam photometer to spectroscopy analyzer. for higher chemical selection or multi-Liquid analysis



General probe

Measuring Principle

The LLA4810-Monitor is based on double wave length measuring principle photometer, Usually uses one beam by modulation system. One single default absorption line without interference is chosen in the near infrared spectral range. A single mode diode laser operating around room temperature scans this single absorption line continuously to get real time measurement. Then calculate the concentration of specified substance by professional mathematic. Automatic corrections for temperature and pressure variations are included(need extra Pressure sensor, or order separately).

Applications

- Process liquid analysis
- Industry chemical process
- Research and Process optimization

Limitations:

- WMS model could not be interfered by general Liquid.
- Applicable for Liquid with suspended particles less than 28.8mg/L;
- PM model might be less interfered by the listed Liquid if existed.
- TM model might be cross interfered by the listed substances if existed, and only applicable for clean Liquid, with suspended particles less than 10mg/M3;

Maintenance and Calibration

The rugged industrial design and periodically purging make the Laser Liquid Analyzer easy to maintain. There are no moving parts in the instrument and none of consumables are needed during normal operation.

All critical parameters are monitored continuously and warning messages are given if maintenance is required beyond the recommended maintenance intervals.

Reliable measurement was assured by the special reference system. Exact reference standard is fixed. Unless it is not stable, you need not any calibration for this system.

Periodically correction is good for extern contaminants overcome.

The routine maintenance interval is three of months.

Installation and Operation

The LLA4810 Monitor is easy to install and operate. Several model structure were designed for variety of industry.

The TR transducer is one unit integrity, can be used for most case; Inserting the sensor part into sample container or pipeline where suitable, and fixing the instrument with attached flange.

The TA/TR model consists of 3 basic units: Transmitter unit, receiver unit and electronics unit. The transmitter and receiver units are mounted directly to the process device across against each other of the transmitter and receiver by DN50/F165 flanges. These are going to be used for high pressure or temperature system only.

There are no moving parts in the instrument, thus preventative maintenance is limited to visual inspection and cleaning of optical windows.

Purging to prevent dust from collecting on the optical windows maybe needed for very dirty system. Experience shows that a three months preventative maintenance interval is sufficient for most applications without special contaminants.

Specifications

Optical path length (OPL): 5mm-30cm;

Bandwidth: <10nm;

Start up time: <3 mins

Response time: Less than 2 seconds

Averaging time: Rolling average from 2 seconds to 24 hours (exp. decay)

Detection limit: Refer to Table 1

Min. measuring range: Refer to Table 1.

Max range: Refer to Table 1.

Dynamic range: 100 to 10000 :1

Instrument span drift: < 4% of measuring range between maintenance intervals

Instrument zero drift: Negligible (<2% of measuring range between maintenance intervals)

Maintenance interval: Recommended every 3 months (no consumables needed)

Calibration: Not needed in general running. In situ with flow through cell, or in separate calibration tube

Input/ Output Signals

Analogue output: 0/4 - 20 mA current loop, 500 & max. the range to be sent can be set by user. And any parameter can be chosen to send .

Digital output: RS 232 or RS485 by protocol of Modbus or STIMcom

Relay output: High Liquid relay (normally closed-circuit relays)

Warning relay (normally closed-circuit relays)

Fault relay (normally closed-circuit relays)

Analogue input: Optional 0/4 - 20 mA.(for flow meter, or pressure sensor in special application suit)

Operating Conditions

Ambient temperature: -20C to +55C

Maximum Sample Pressure: <1Mpa or 10 bars abs for general model. High pressure system under requirement;

Maximum Sample Temperature:

T type: Max <200°C;

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web: <http://www.fullsense.com.cn/> <http://www.bigdipper-technochem.com>

Professional Chemical Analyzer Service /BigDipper Technochem Institute, Beijing China

TAR type: Max<500°C(direct set with cooling air). Extended to 1500°C possible with special installation.
Protection classification: Transmitter and Receiver units: IP65, optionally Ex-p adapted
Electronics unit: IP55, optionally IP65
Mains voltage: 24V DC
Power consumption: Less than 50 Watts (not include consumption of valve and air resource device)

Mounting

Standard mounting: DN50/PN10, F165
Alignment tolerances: Flanges parallel within 1° with <1m light path(AR Model only).
Purging of air: The pressure of purging liquid must be 0.5 kgf/cm² higher than that of samples in pipe.
Cooling air: adjust the flow to assure the temperature inside sensor is lower than 70 °C, this temperature could be read by instruments. In the case of high temperature application, cooling air must be guaranteed to supply continuously, once stop longer than seconds might damage the sensor. It was recommended to select AR model for high temperature application if possible.
Air connect.: φ2- 6 pipe with M10 screw.

Dimension and Weight

TR: Dia.150x (100/possible sensor length+500/Electronics); 15Kg
Insertion Depth: <15cm(varying from range)
Diameter of insertion part: φ50mm
TR/TAR:
Transmitter unit: Dia: 150x350 mm, 8 kg
Receiver unit: Dia.150x350 mm] 8 kg
Electronics unit: Dia. 120 x 400 mm, 5 kg

Ordering Code:

TR/TAR-L[sample phase]A4810-[Product ID]-[Liquid]-R(range)-T[sample temperature]-P[sample pressure]-M[c-s-w]-S[serial port]P[communication portocol]-A[analog output standard]

Coding information:

Sample phase: L for liquid sample, G for gases;

Product ID: Refer to Table 1.

Connect code: 0= none; 1=threat; 2=clamp; 3=Flange;

Code Format of Contact Materials: xyz

C: structure materials;

W: optical window;

S: seal ring

Wet material code: 01=PVC; 02=Nylon; 04=PTFE; 05=Acrylonitrile butadiene rubber;

06=Fluorinated rubber; 10=Iron; 11=AM alloy; 12=SS316; 13= Hastelloy – C; 30=Optical glass; 31:Quartz

BigDipper Technochem Institute

Call: 86-10-8264.0226; 8264.0225; Fax:86-10-8264.0221; 8264.0238;

P.o.Box 603 BDTI Beijing, China 100080

Email: sales@bigdipper-technochem.com web: <http://www.fullsense.com>

Address: Building #1, NanSanJie, ZhongGuanCun, Haidian district

Beijing, China 100080

Table 1 Specifications and Price List for Transducer of TR-4810-WMS

| Model | Code | Measurement Property | Specifications | Applications |
|-----------|-----------|---|--|--|
| LLA4812TP | SWNIR2B01 | Total moisture both of intra- or intermolecular water | Moisture 3-30000ppm/1m Environ temperature:0-35°C | *Not recommended for starch, alcohols, acid and other polyols; not for liquid with dissolved gas as N ₂ O,CH ₄ , N ₂ H ₄ , not for liquid containing Te; |
| LLA4812TP | MNIR2B01 | Total moisture of absorbed and condensed | Moisture :0.12-1200ppm/1m Environ temperature:0-50°C Max to 60°C | *Not recommended for starch, alcohols, acid and other polyols; Not suitable for aromatics,NH ₃ liquids; |
| LLA4812TP | MNIR2B02 | Moisture both of water with one hydrogen bond and water with two hydrogen bonds | Moisture :0.12-1200ppm/1m Environ temperature:0-50°C | *Not recommended for starch, alcohols, acid and other polyols; Not for NH ₃ ,C ₂ H ₂ liquids |

- LLA: Laser transparent photometer;
- LDL: Low Detect Limit;
- The range data is with 1 m optical path cell, unless other where specified with OPL;

Ordering Information

- Specify the low and high limit of your applications possible.
- High pressure over 10 kgf/cm² system would be charged extra;
- Other accessories need independent order.
- Transfer package size: approximately: 100x45x40 cm.