T-BD6-MS4810TP Series NIR Spectrometer

Process Liquid Moisture Analyzer

Ref: T-BD6-MS4812TP
Revision:2004-09-1

Applicable to Moisture Analysis of liquid Process

- Rugged industrial design, real time measurement
- Continuously in situ monitoring, No Liquid sampling
- High selectivity by spectroscope 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
- Series structure suit to varies device and arts

Measuring Principle

The MS4810-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 NIR 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

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web: http://www.bd-research.com/ http://www.bigdipper-technochem.com

Limitations:

- Applicable for Liquid with suspended particles less than 28.8mg/L;

Maintenance and Calibration

The rugged industrial design and periodically purging make the NIR Gas 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 MS4810 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 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 deeded in general running. In situ with flow through cell, or in separate calibrationsample.

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 gas 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;
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

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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: Dry and oil-free pressured air or gas, or by fan. The pressure of purging air must be 0.1 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/TA:
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:

T/TA-L[sample phase]A4810-[Product ID]-[gas]-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

T-BD6-MS4810 Models

Model	Code	Measurement Property	Specifications	Applications	
MS4812-TP-	SWNIR2B01	Total moisture both of intra- or intermolecular water	Moisture : 0.25-2500ppm,or higher; Environ temperature:0-35°C	*Not recommended for starch, alcohols, acid and other polyols; not for liquid with dissolved gas as N2O,CH4, N2H4, not for liquid containing Te;	
MS4812-TP	MNIR2B01	Total moisture of absorbed and condensed	Moisture : 0.01-100 mg/L or higher ; Environ temperature:0-50°C Max to 60°C	*Not recommended for starch, alcohols, acid and other polyols; *Not suitable for aromatics, amides liquids;	

MS4812-TP	MNIR2B02	For water with single or double hydrogen bonded molecules	Liquid moisture: 0.01-100mg/L or higher; Environ temperature: 0-40°C WT :-40-50°C	*Not recommended for starch, alcohols, acid and other polyols; Not for NH3,C2H2 liquids	
MS4812-TP	LNIR2B01	For water with single or double hydrogen bonded molecules	Liquid moisture: 0.01-100mg/L or higher; Environ temperature: 0-40°C WT :-40-50°C	*special for starch, alcohols, acid and other polyols;	
MS4813-TP	MNIR3B02	Special	Liquid moisture: 0.01-100mg/L or higher; Environ temperature: 0-40°C WT :-40-50°C	*special for starch, alcohols, acid and other polyols, or other Cross Interference;	
MS4821-TS	LNIR1B02	Any moisture	Liquid moisture: 0.005-50mg/L or higher; Environ temperature: 0-40°C WT :-40-50°C	*special for starch, alcohols, acid and other polyols, or other Cross Interference; *Not suitable for liquids with dissolved gas as H2S;	

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