

UV400 ATEX

Online Water Analyser



Specialist Of UV Spectroscopy

> UV400 ATEX Online Water Analyser

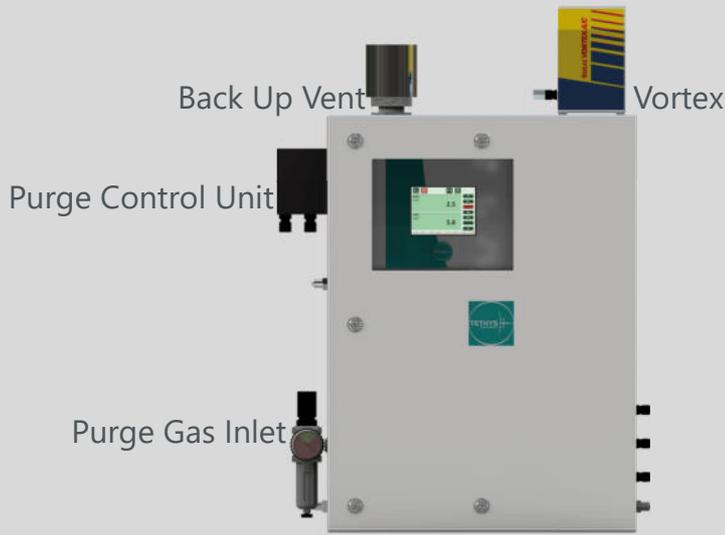
The UV400 ATEX, based on a modular concept, allows to monitor one or several parameters for process water, cooling water or waste water. The special enclosure and air purge system allows to use it on hazardous areas classified "Ex" like refineries and chemical plants.

Mainly based on UV spectroscopy, well known for its stability and low operating cost, the UV400 ATEX can measure parameters like aromatics hydrocarbons (PAH), hydrogen sulphide, organic matter, ammonia, phosphate and turbidity. Each parameter corresponds to a specific optical module that can be selected by the user while ordering the analyser, depending on the application.

Thanks to its automatic cleaning system and its extremely long life time lamp, the maintenance is roughly limited to the periodic refill of the inexpensive cleaning solution and eventually reagents depending on the parameters.

A web-based interface allows the control and the troubleshooting at distance though an ATEX Wi-Fi or Ethernet connection using a standard browser on a computer or tablet.





Ex pz protection according to EN94/9/EC

The UV400 ATEX has a IP 65 stainless steel enclosure with an air purge system Ex pz to work on hazardous areas classified "zone 2" where a risk of explosive atmosphere is present like refineries or chemical plants.

Two alarm contacts are provided if the pressure inside the enclosure drops below the adjustable setting points. This alarm can be used to switch off the power of the enclosure.

A thermostatic vortex cooler can be installed as an option to maintain a moderate temperature inside the enclosure for outside use with high ambient temperature.

After certification, a marking plate can be fixed on the enclosure with the specified marking, example :

II 3G Ex [pz] IIC T3

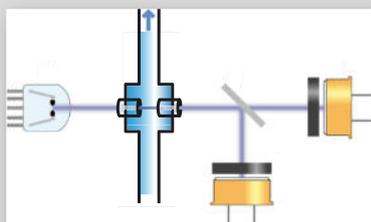
II : non-mining	3G : category 3 for Gaz	PZ : pressurised	IIA : propane	T1 : 450°C
	3D : category 3 for Dust		IIB : ethylene	T2 : 300°C
			IIC : Acetylene, hydrogen	T3 : 200°C
				T4 : 135°C
				T5 : 100°C
				T6 : 85°C

Main Method : UV-visible Spectroscopy

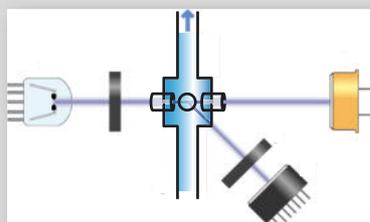
- All the measurements (PAH, H₂S, UV254, NH₄, PO₄, Colour) are based on UV-VIS spectroscopy that brings fast and stable measurements with a simple hydraulic circuit for a high reliability.
- All the measurements are done within 5 seconds except H₂S, NH₄ and PO₄ that require about 3 minutes.
- The UV source is a xenon flash lamp specified for 10⁹ flashes that corresponds to more than 10 years of life time with one measurement every minute.
- Three external turbidity probes (high, medium and low range) are also available if the measurement need to be done in situ, for example before filtering.



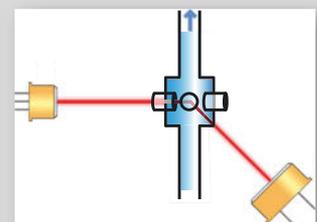
Patented clogging-free flow cell



UV double wavelength absorbance principle

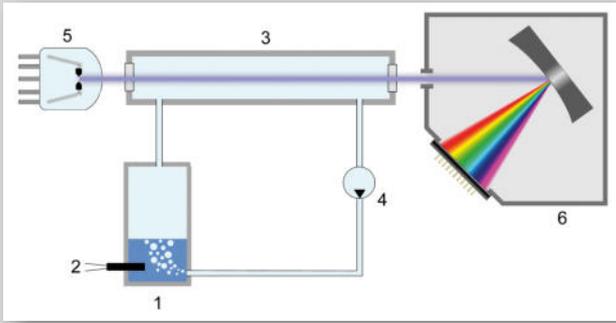


UV fluorescence principle



Turbidity by laser diode principle

Hydrogen Sulphide and Ammonia : a **UNIQUE** method



1: stripping pot, 2 : temperature probe, 3 : gas flow cell, 4 : gas pump, 5 : xenon flash lamp, 6 : spectrograph

The hydrogen sulphide and ammonia measurement are based on the UV absorption of the hydrogen sulphide gas or ammonia gas after a stripping phase.

Consequently, the turbidity or colour of the sample has absolutely no influence and measurements can even be carried on activated sludge.

The ammonia gas has a typical periodic absorption spectrum that is analysed using a fast Fourier transform (FFT) that brings an exceptional selectivity. No interference has never been reported after years of operation on many different applications.

A small quantity of hydrochloric acid is added to the sample for hydrogen sulphide, or NaOH solution for ammonia.

Low Maintenance and High Reliability

The design has been specially oriented for low maintenance and high reliability on the measurements.

To avoid deposits on the optical windows and tubing, the UV400 ATEX has a built-in automatic cleaning system that injects a 5% sulphuric solution normally once day.

An auto-zero is performed at the same time to avoid any drift of the measurement.

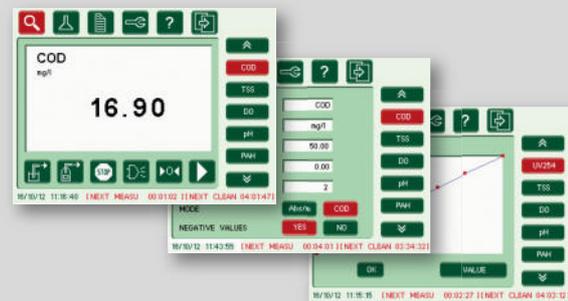
The patented flow cell limit the risk of clogging inside the flow cell.

The level of the cleaning solution as well as reagents for H₂S, NH₄ or PO₄ can be controlled at distance to plan the refill.

User-Friendly Interface

The colour touch screen and intuitive interface available in 8 different languages (Chinese, English, French, German, Italian, Portuguese, Spanish, Turkish) makes very easy to test or configure the analyser.

Many test functions allows to test and troubleshoot each element of the analysers (light signal, pumps, solenoid valves, etc...) to setup quickly a maintenance diagnostic.



Communication

The RS232 port supports the MODBUS protocol to transmit each measuring channel value to a SCADA system.

Additional parameters are available like status code, error code, calibration values and pumps run time.

Basic 4-20 mA output modules can be plugged on the main board for each measuring channel, in the limit of 12 modules. A USB port enables to download on any USB key the last 5000 recorded measurements as well as a diagnostic file containing the configuration and useful information for remote troubleshooting.

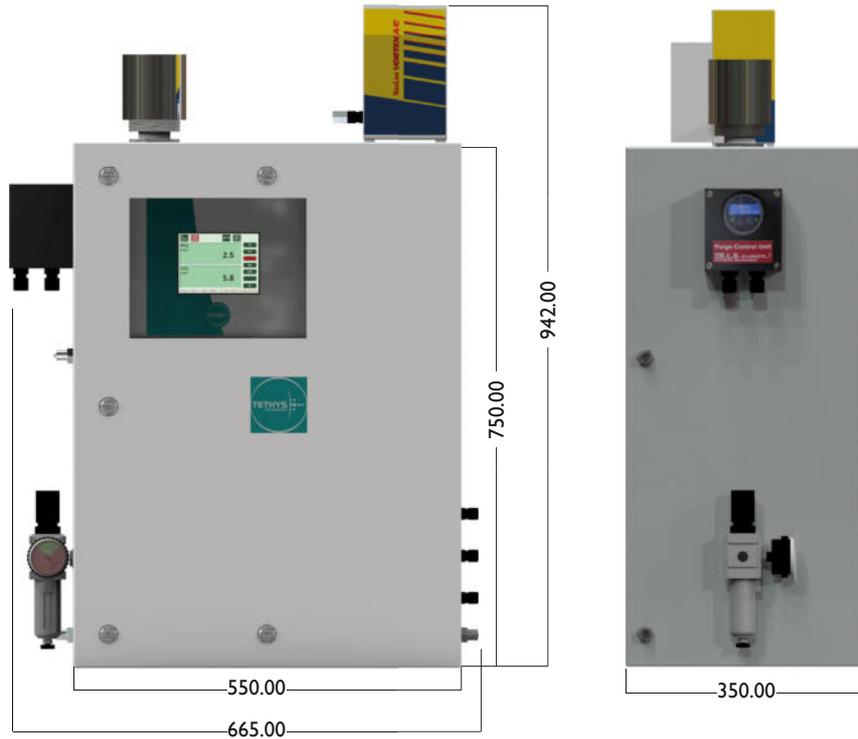
The new web interface makes possible to drive remotely the analyser from any computer, tablet or i-phone with a web browser. For this, an optional Wi-Fi or Ethernet module is added inside the analyser to connect it to an existing network with an internet gateway.

The recorded measurements file can be imported to Excel for graphs or other treatments.

The software of the analyser can be upgraded by connecting a USB key.



> UV400 ATEX Parameters Specifications



Parameter	Standard range Other ranges on request	Typical Repeatability For low values (<10% FS)	Accuracy On standard solution
UV254	0-200 Abs/m 0-600 Abs/m 0-2000 Abs/m	+/- 0.05 Abs/m +/- 0.15 Abs/m +/- 0.5 Abs/m	+/- 2%
COD by UV correlation	0-100 mg/l COD 0-2000 mg/l COD 0-20000 mg/l COD	+/- 0.05 mg/l COD +/- 1 mg/l COD +/- 10 mg/l COD	+/- 2%
BOD by UV correlation	0-100 mg/l BOD 0-1000 mg/l BOD 0-10000 mg/l BOD	+/- 0.05 mg/l BOD +/- 0.5 mg/l BOD +/- 5 mg/l BOD	+/- 2%
TOC by UV correlation	0-100 mg/l TOC 0-1000 mg/l TOC 0-10000 mg/l TOC	+/- 0.05 mg/l TOC +/- 0.5 mg/l TOC +/- 5 mg/l TOC	+/- 2%
Nitrate	0-100 mg/l NO ₃	+/- 0.1 mg/l NO ₃	+/- 2%
Colour	0-100 pt/Co 0-1000 pt/Co	+/- 1 Pt-Co +/- 2 Pt-Co	+/- 2%
PAH (aromatics)	0-10 mg/l C ₆ H ₆	+/- 0.01 mg/l C ₆ H ₆	+/- 2%
Oil in water	0-100 ppm OIW 0-1000 ppm OIW	+/- 0.1 ppm OIW +/- 1 ppm OIW	+/- 2%
Phosphate	0-2 mg/l P-PO ₄ 0-20 mg/l P-PO ₄	+/- 0.01 mg/l P-PO ₄ +/- 0.1 mg/l P-PO ₄	+/- 2%
Ammonia	0-100 mg/l NH ₄	+/- 0.2 mg/l NH ₄	+/- 5%
Hydrogen Sulphide	0-20 mg/l H ₂ S	+/- 1 mg/l H ₂ S	+/- 2%
Turbidity (TSS by correlation)	0-10 NTU 0-100 NTU 0-1000 NTU	+/- 0.01 NTU +/- 0.1 NTU +/- 1 NTU	+/- 2%

> UV400 ATEX General Specifications

Sample flow	Recommended : 0 - 5 l/min 0 - 0.5 l/min for NH4 or H2S
Sample pressure	0 - 4 Bar (0 - 1 Bar with sampling peristaltic pump) 0 - 0.5 Bar for NH4 or H2S
Sample temperature	0 - 80 °C 0 - 30 °C for NH4 or H2S
Wet parts materials	Quartz, Polypropylene, Polyethylene, FPM (viton), PMMA (+ pharmed and glass for NH4 or H2S)
Measuring time	5 sec (Except PO4, NH4, H2S : 3mn)
Measurement interval	1 min to 720 min (except PO4, NH4, H2S : 4mn.) PhysicoChemical parameters may be continuous
Memory	5000 lines of measurements (up to 16 channels) with date and time
Consumption	Cleaning solution (5% sulfuric acid): 220 ml/day Reagent per measurement : 2 ml per measurement / NaOH 10% for NH4: 2 ml per measurement / HCl 10% for H2S: 2 ml per measurement
Maintenance interval	Recommended: 6 months to 1 year (except for refilling)
Power supply	230v AC 50/60 Hz 100 VA (115v on request)
Screen	Colour TFT LCD 320x240 pixels with LED backlight
Communication	RS232, Modbus or HTTP/Web interface, compatible with Windows7, with Internet Explorer version 9, Nexus 7 tablet under Android with Opera version 12.10, Apple I-phone 4S with Safari RS485 for external probes (DO, TSS) USB WI-FI (IEEE802.11B) optional Ethernet (IEEE802.3) optional
Certifications	CE, EN 61010-1, EN 61326
Enclosure	Stainless Steel IP65
Dimensions	750 x 550 x 350 mm
Weight	40 to 50 kg depending on the configuration

> UV400 ATEX Parts references

Basic unit

UV400 ATEX	Basic unit (no measurement included) Color graphic display 320x240 pixels with touch screen (inside the enclosure) Built-in data logger, memory 5000 measurements for each parameter 12 sockets for input and output modules (not included, refer to options) 6 available glands for inputs / outputs RS232 included (Sub-D 9 ways female connector) with 2 meters cable for PC USB port integrated for USB key connection(inside the enclosure) Automatic cleaning system with 2-litres tank Power supply 90-260 VAC 47-63 Hz Enclosure stainless steel 316L, IP65/Nema4, 550x750x350mm (WxHxD) Mounting lugs for wall 580x695mm (WxH) / 40 to 50 kg Designed for marking II 3 G Ex pz IIC T3 Gc
-------------------	---

Sampling pump

P	Sampling peristaltic pump for unpressurized water Built-in inside the enclosure Flow of about 0.6 litre/min Discontinuous operating to increase tube lifetime
----------	---

Vortex cooler

V	Vortex cooler for high ambient temperatures Operating air pressure: 6 -7 Bars Cold air flow: about 660 l/min Warning: the air temperature and flow must be controlled to limit the outlet air temperature
----------	---

Measurement module by UV absorption

COD-H	Organic matter high range UV absorption at 254 nm high range: 0 – 2,000 Abs/m (equivalent to approx. 20,000 mg/l COD on municipal waste water)
COD-L	Organic matter low range UV absorption at 254 nm low range: 0 – 200 Abs/m (equivalent to 100 mg/l COD on river water)
COD-M	Organic matter Medium range UV absorption at 254 nm medium range: 0 – 600 Abs/m
NO3	Nitrate Range: 0 – 100 mg/l NO3 (0 – 25 mg/l N of NO3) Measurement possible until 250 mg/l NO3 (60 mg/l N-NO3)

Measurement module by visible absorption

CO-H	Colour high range Range: 0 – 1000 Pt-Co unit
CO-L	Colour low range Range: 0 – 100 Pt-Co unit

Measurement module by colorimetry

PO4-H	Phosphate high range High range: 0 – 20 mg/l P (60 mg/l PO4) Sampling peristaltic pump included
PO4-L	Phosphate low range Low range: 0 – 2 mg/l P (6 mg/l PO4) Sampling peristaltic pump included Range: 0 – 100 Pt-Co unit

Measurement module by UV fluorescence

PAH	Poly-aromatic hydrocarbons Range: 0 – 10 ppm phenol (equivalent to approx. 0 – 100 ppm oil with 10% aromatic ratio)
------------	--

> UV400 ATEX Parts references

Measurement by nephelometry

IRTURB-H	Internal turbidity sensor high range High range: 0 – 1,000 NTU Nephelometric method by laser diode at 650 nm (850 nm on request)
IRTURB-M	Internal turbidity sensor medium range Low range: 0 – 100 NTU Nephelometric method by laser diode at 650 nm (850 nm on request)
IRTURB-L	Internal turbidity sensor low range Low range: 0 – 10 NTU Nephelometric method by laser diode at 650 nm (850 nm on request)

Measurement module by UV absorption in gas phase

NH4	Ammonia Range: 0 – 100 mg/l NH4+ (other ranges on request up to 4000 mg/l NH4+)
H2S	Hydrogen sulfide Range: 0 – 20 mg/l H2S (other ranges on request up to 100 mg/l H2S)

Input modules

MI4-20	4-20 mA input module Isolated 4-20 mA input Impedance: 100 Ohm
MIL	Double logical inputs module Input no 1: external pulse command for measurement Input no 2: measurements inhibition Isolated 0 –48 V DC inputs Impedance: >10 Kohm

Output modules

MO4-20	4-20 mA output module Isolated 4-20 mA output Active output, Max load 500 Ohm
MRELAY	Relay module Contact rating: 2A/220V

Recommended consumables for 2 years :

- P-ACI-HD1** : Head of cleaning pump (x1)
- P-RGT-HD1** : Head of reagent pump (x1) (only for NH4 or H2S)
- T-PHAR-1** : Tubing 6.4x9.6 mm (if optional sampling pump)
(x2 to x8 depending on sampling pump use)

Cleaning solution and reagents (if any) are not provided

The manufacturer reserves the right to modify and/or change any specifications, dimensions, design or drawing at any time without prior notice

TETHYS Instruments
57, Chemin du vieux Chêne, 38240 MEYLAN -France-
Tel : +33 4 76 41 86 39 - Fax : +33 4 76 41 92 27
Mail : sales@tethys-instruments.com
Web : www.tethys-instruments.com



Management System
ISO 9001:2008



www.tuv.com
ID 9105083475

IND#B - E.COM.15

