

APPLIED
ANALYTICSOMA-300-CL2
Chlorine Analyzer**Optimized to monitor:**

- ethylene dichloride (EDC) purity in the production of PVC
- NCl_3 in the production of chlorine
- TiCl_4 and vanadium in the production of titanium oxide
- VOCl_3 in organic synthesis
- and more at www.a-a-inc.com

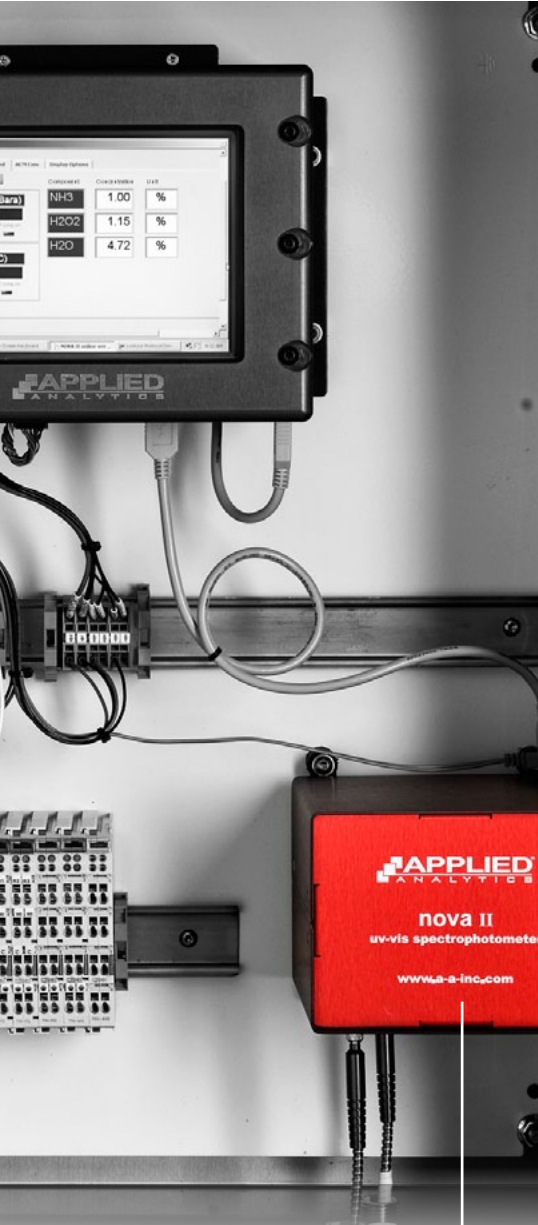


The OMA-300-CL2 showcases the capacity of full-spectrum diode array technology. This solid state instrument smoothly monitors chlorine and derivative compounds' concentrations from trace (ppm) levels up to saturated (high percent) levels, offering seamless dynamic range across a variety of chlorine-related applications.

With Multi-Component Analysis driven by diode array, a single OMA-300-CL2 monitors up to four chemicals in the process stream simultaneously.

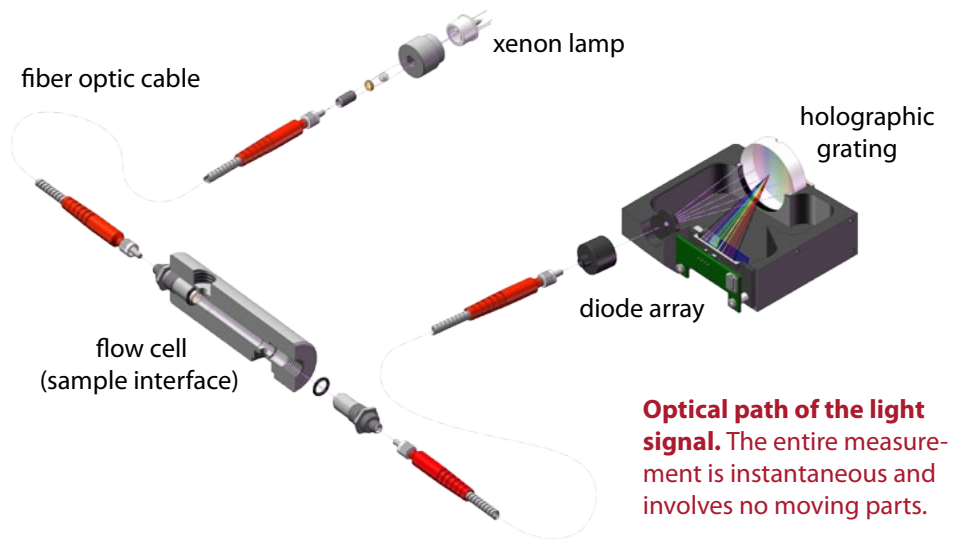
FREQUENT EXTENSIONS:

 ClO_2 NCl_3 TiCl_4 V^{2+} VOCl_3



The nova-II Spectrophotometer

- UV-VIS diode array detection
1,024 photodiodes
- broad spectral response
190-800nm range
- maximal light throughput
high-grade optics, strong Xe source
- exceptional in low UV range
minimal stray light
- CMOS analog circuitry
low noise, low power consumption
- streamlined, solid state design
no mirrors or filters



Optical path of the light signal. The entire measurement is instantaneous and involves no moving parts.

MONITORING FERRIC CHLORIDE (FeCl₃) AND CHLORINE (Cl₂) IN THE MAKING OF PVC

Ethylene dichloride (EDC) is the first intermediate in the manufacturing of the versatile plastic PVC from raw materials. Heated to 500 °C in a cracking furnace, EDC splits into VCM (the precursor to PVC) and recyclable HCl. The EDC entering the furnace sometimes contains ferric chloride, the catalyst used to chlorinate ethylene in creating EDC; this contamination is far from trivial as trace FeCl₃ is known to foul the furnace. Furthermore, PVC made from EDC with impurities (i.e. low-level FeCl₃ and chlorine) does not meet the specifications of high-quality PVC.

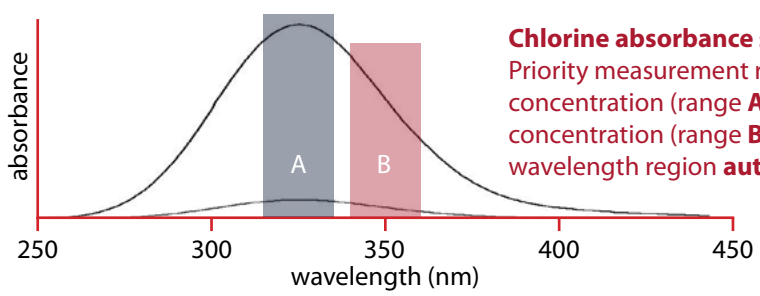
MONITORING TITANIUM TETRACHLORIDE (TiCl₄) AND VANADIUM IN THE PRODUCTION OF TITANIUM OXIDE (TiO₂) PIGMENT

Known in painting as the “whitest white,” TiO₂ is a widely used pigment. In the chloride production method, titanium ore is converted to TiCl₄, from which metallic chloride impurities are discarded; oxidation of purified TiCl₄ yields bright, finish-ready TiO₂. Two yield-critical points in this process require online analysis: 1) ensuring that the TiCl₄ is vanadium-free to protect pigment quality, and 2) monitoring effluent from the oxidation vessel for unreacted TiCl₄ to verify the efficiency of conversion to desired TiO₂.

SOLUTION: THE OMA-300 CHLORINE COMPOUND ANALYZER

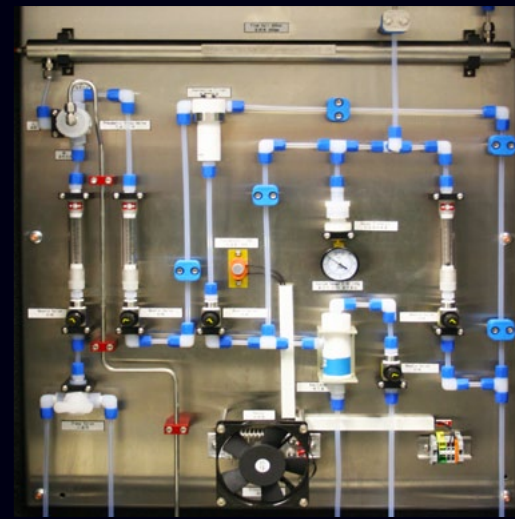
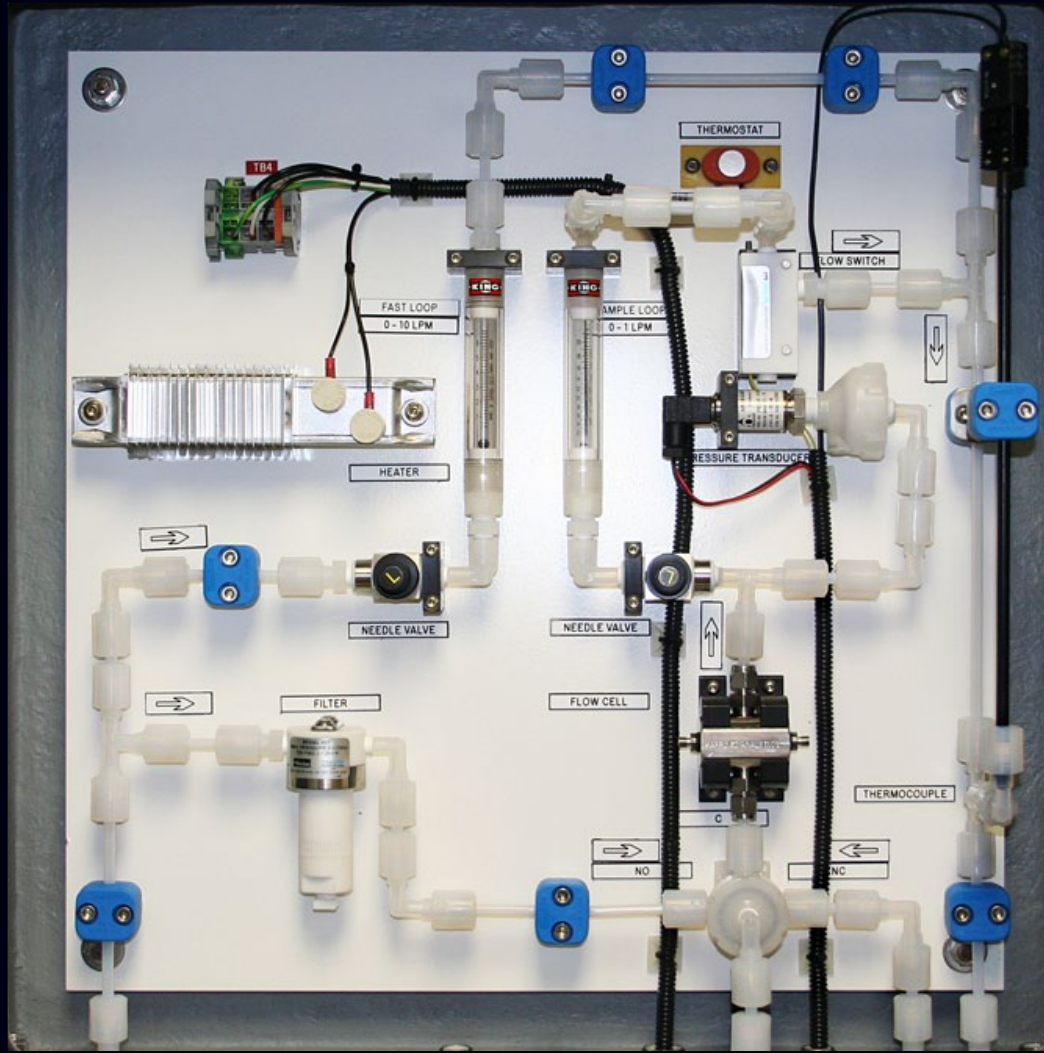
While traditional photometric analyzers struggle with cross-interference between different chlorine compounds, the OMA-300 has **Multi-Component Analysis** powered by diode array technology. To view an animated explanation of how AAI’s proprietary algorithm isolates the precise absorbance of each chlorine compound from the stream absorbance spectrum, please visit: <http://www.a-a-inc.com/multi-component/>

The ability to monitor a species such as chlorine accurately both at trace ppm levels and at high per cent levels is known as **dynamic range**. This versatility revolves around light signal optimization according to current concentration. Chlorine’s high-absorbance 315-330nm range is useful when monitoring very low concentrations, but when the concentration rises significantly, absorbance is too strong in this range and no light is transmitted; in a high %wt chlorine scenario, the moderate-absorbance 390-410nm range is ideal. The OMA-300 shifts wavelength range seamlessly in step with live chlorine concentration, exploiting the broad spectral response of the nova-II for unrivaled dynamic range.



Chlorine absorbance spectrum. Priority measurement ranges for low Cl₂ concentration (range A) and high Cl₂ concentration (range B). The nova-II shifts wavelength region **automatically**.



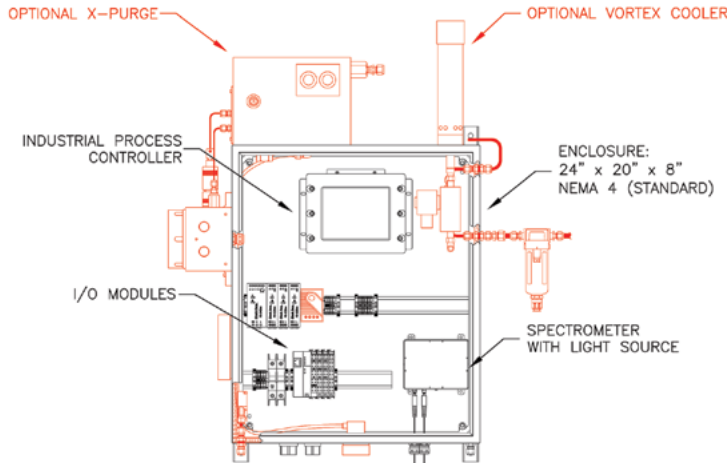


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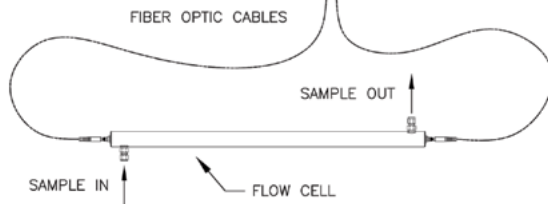
SAMPLE CONDITIONING

- 1) 0-50 % Cl_2 and 0-30% NCl_3 ; Teflon fittings prevent particle generation.
- 2) 0-10ppm **vanadium** in liquid TiCl_4 stream; used in the production of white TiO_2 pigment.
- 3) 0-100ppmv Cl_2 in vent stream; used downstream of a wet scrubber system for environmental compliance.
- 4) 0-10ppm **VCl_3** in liquid TiCl_4 stream; used to measure TiCl_4 purity in a distillation operation.
- 5) 0-2,000 ppm **NCl_3** in gas; used for safety.
- 6) 0-10ppm **VOCl_3** in liquid.

S P E C I F I C A T I O N S



STANDARD OMA-300 CHLORINE COMPOUND ANALYZER.
COMMON OPTIONS SHOWN IN RED.



Measurement Technology	UV-VIS diode array spectrometer (nova-II)	
Light Source	Pulsed xenon lamp (~5 year lifespan); deuterium and tungsten sources available	
Sample Introduction	Flow-through cell; standard or custom-design sampling system (optional)	
Accuracy (by Range)	Cl₂ 0-100 ppm: ±5 ppm 0-10,000 ppm: ±2% full scale or 5 ppm* 0-100%: ±2% full scale TiCl₄ 0-2,000 ppm: ±15 ppm 0-10,000 ppm: ±1% full scale vanadium 0-5 ppm: ±0.3 ppm	FeCl₃ 0-300 ppm: ±1% full scale 0-10,000 ppm: ±1% full scale NCl₃ 0-100 ppm: ±5 ppm 0-10,000 ppm: ±1% full scale 0-5%: ±1% full scale (*whichever larger)
Calibration	For most applications, factory calibrated with certified calibration gases/liquids	
Verification	Easy verification/validation with gas/liquid samples or neutral density filters	
Ambient Temperature	Standard: 0 to 55 °C (32 to 131 °F);	Optional: -20 to 55 °C (-4 to 131 °F)
Sample Temperature	-20 to 150 °C (-4 to 302 °F)	
Sample Pressure	Immersion probe: 100 bar (1470psig)	Flow cell: 206 bar (3000 psi)
Environment	Indoor/outdoor (no shelter required)	
Size	Analyzer: 24" H x 20" W x 8" D (610mm H x 508mm W x 203mm D) Optional sampling system: 24" H x 30" W x 8" D (610mm H x 760mm W x 200mm D)	
Weight	32 lbs. (15 kg)	
Wetted Materials	Analyzer: Teflon, K7 glass, Kalrez, Hastelloy C-276 Optional sampling system: Teflon, quartz, Kalrez, Hastelloy C-276	
Outputs	One galvanically isolated 4-20mA output per component; modbus TCP/IP (optional); RS232 (optional); Fieldbus, Profibus, and HART (all optional); two digital outputs for fault and sampling system control (user programmable)	
Electrical Requirements	85 to 264 VAC 47 to 63 Hz	
Power Consumption	45 watts	
Area Classification	General Purpose (standard) / Class I, Div. 2 (optional) Class I, Div. 1 (optional) / ATEX Exp II 2(2) GD (optional)	

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