PROCESS

# Model IPS-4 Integrated Process UV / Visible Spectrophotometer

## Features and Benefits

- Measures up to eight analytes
- Low cost of ownership
- Long lamp life
- No moving parts
- IP65, weatherproof
- Integrated, customizable sample system
- Fast Ethernet and MODBUS communications

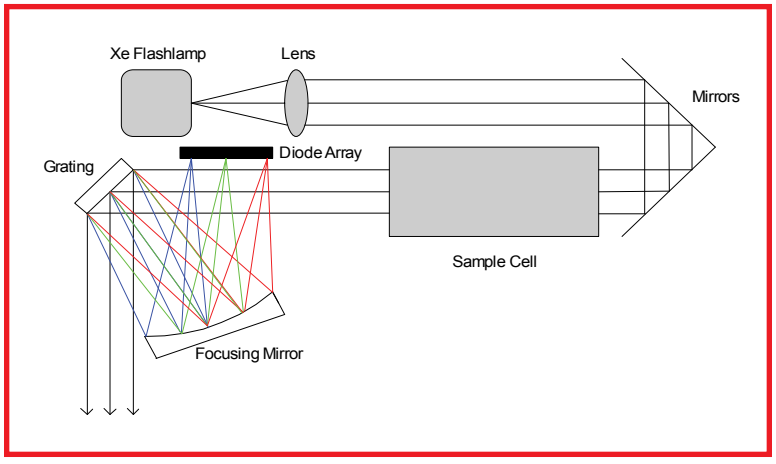

*General Purpose IPS-4*

## The Need

Today's chemical producers and consumers are under tremendous pressure to cut costs, lower maintenance expenses, and improve product quality. In order to meet these demanding objectives, process engineers and operators need analytically capable and reliable process analyzers which require minimal maintenance and operator intervention. The analyzers also need to be easy to use and capable of communicating in a wide variety of ways. It is also a benefit if the analyzer is durable enough to be installed in outdoor, wash-down, hazardous, and other environmentally harsh locations.

## The Solution

AMETEK's IPS-4 UV analyzer is a huge step forward in capability and reliability for process spectrophotometers. Using the most modern electronics and diode array technology, the IPS-4 is engineered to perform a wide variety of liquid and gas analyses using UV-VIS spectroscopy.




*Schematic of the IPS-4 UV's Optical System*

### *Analytical Performance*

The IPS-4 is capable of detecting, quantifying, and compensating for multiple chemicals of interest and interfering species. Up to eight analytes of interest can be measured simultaneously through the combination of a modern, diode array-based optical system with our proprietary process-ready electronics.

This combination offers many advantages such as no moving parts, a high signal-to-noise ratio, minimized stray light effects, fast and full spectral acquisition, and wide dynamic range. These traits help to make the IPS-4 a highly capable process analyzer.

### *Optical System*

The IPS-4 UV's optical system is designed to increase reliability and dramatically reduce the need for routine maintenance, thereby drastically cutting its cost of ownership. The lamp used in the optical system is a xenon flash lamp which has a greater than two year expected life. Use of the diode array and fixed optical bench means

that there is no filter wheel or motor to maintain, no optical filters to replace, and no optical couplings to align. The resulting optical system is small, insensitive to mechanical tolerances, insensitive to movement, and free of moving parts.

The AMETEK-designed electronics are engineered to withstand harsh outdoor, industrial environments. They possess excellent temperature stability, reliability, and a host of self-diagnostic and predictive maintenance capabilities. The combined result of the IPS-4's design is a spectrophotometer with high reliability and a minimal need for routine maintenance.

### *Interface Options*

Manufacturing facilities have a wide variety of communication needs from their process analyzers. To meet the varied needs of our customers, we have equipped the IPS-4 with numerous analog and digital communications capabilities. A detailed, multi-line display along with a 22-key keypad provides the primary local indications. The keypad is a stainless steel, piezo-electric device which is the ultimate in durability and reliability. The pixel-based display is detailed enough to allow for a selection of display language. The analyzer also communicates through a variety of analog signals, alarm contacts, and three types of digital communication.

Digital communication options include a RS-232, RS-485 with MODBUS RTU protocol, and a built-in Fast Ethernet port.

### *Wide Environmental Tolerance*

Process analyzers must often be installed in harsh environments. Unlike other process analyzers, the IPS-4 is designed to handle most environmental challenges without the need for additional protection or prohibitively expensive shelters.

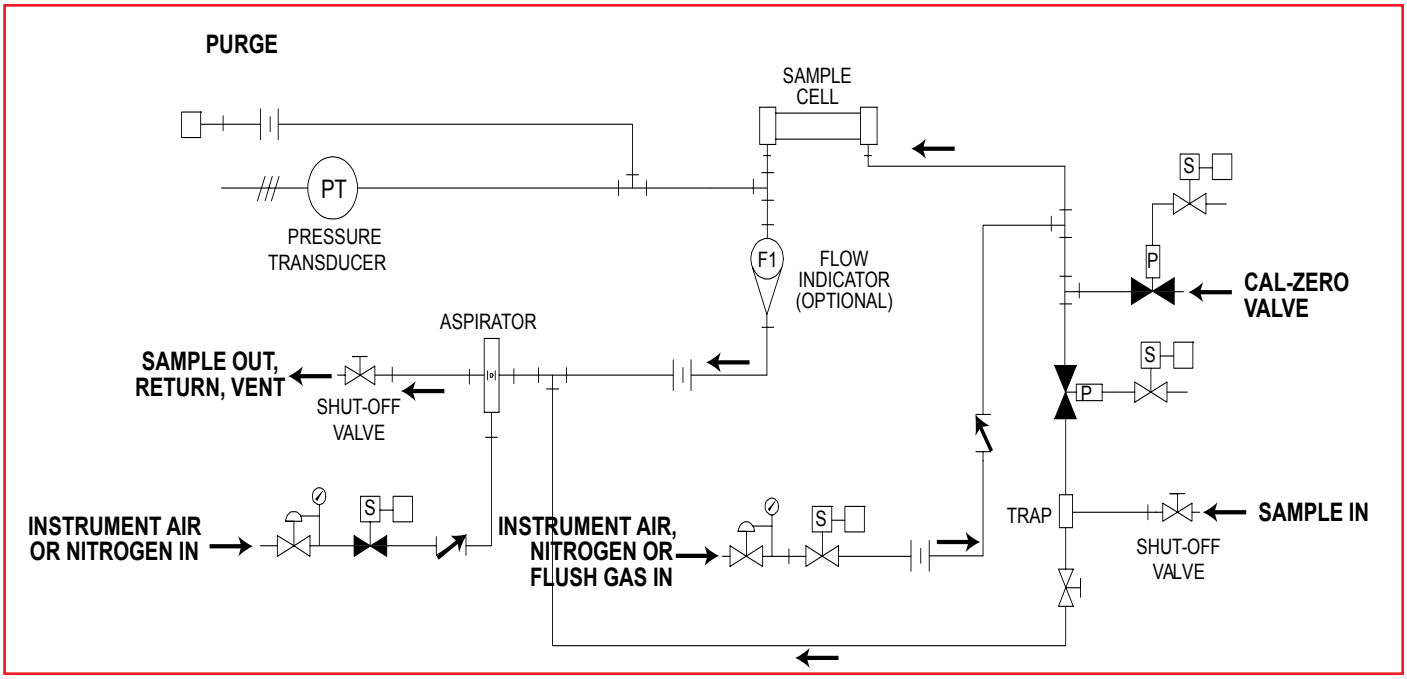
The IPS-4 is supplied in an IP65 NEMA4 optional enclosure. This enclosure is more than capable of handling even wash-down environments without allowing water or dust to ingress. The standard enclosure is made from 304 stainless steel, with 316 stainless steel as an option.

When installed outdoors, the IPS-4 will tolerate ambient temperatures from -20° to 50°C (-4° to 122°F) without external heating/cooling. When installed indoors, the analyzer takes up minimal space as it is designed with a very narrow profile. The width of the IPS-4 has been kept to only 78 cm (<31 inches) to minimize the amount of precious wall space it occupies. This narrow width is maintained even when a wide range of custom sample handling and conditioning systems are integrated into the IPS-4's sample cell enclosure.

### *Custom Sampling Systems*

The IPS-4 is engineered to be a fully integrated, turn-key solution to your specific process analysis need. AMETEK will engineer a sample handling and conditioning system to meet the requirements of your sample fluid and application. Automatic zero and span fluid injection, corrosion-resistant materials, filtration, pumps or eductors, and heated sample lines are a few of the customizations AMETEK can engineer into the IPS-4 to meet your application requirements.

The IPS-4 may be the solution you need to improve the quality and efficiency of your process. Contact your AMETEK Process Instruments salesperson to discuss your specific application today.




*Flow diagram of an optional gas sample system*

*IPS-4 equipped with optional gas sampling system and optional sample system heater*

## Performance Specifications

**Photometric Range:** 0 to 3.0 AU; Minimum Full Scale is 0.1 AU at specified precision

**Analyzer Range:** ppm to 100% depending upon specific application

**Measurement Precision[1]:** <1% of full scale range

**Repeatability[1]:** <2% of full scale range (application specific)

**Linearity[1]:** <1% of full scale range

**Stability[1]:** 0.5% of full scale range

**24-Hour Zero Drift[1]:** <1% of full scale range over 24 hours

**Response Time:** <2 seconds for the photometric measurement. Total system response depends upon sample system.

**Sample System Limits**

Sample Pressure: Up to 100 barg (1450 psig) for some configurations

Oven Temperature: Oven heater capable of maintaining 150°C (302°F)

**Analytes:** Up to eight analytes can be measured

**Instrument Air:** 4.8 – 6.9 barg (70 - 100 psig)

**Inputs:**

2 non-isolated analog inputs (0-5V, 0/4-20mA)
2 optically isolated discrete DC inputs
22 key piezoelectric keypad

**Outputs:**

265 x 64 pixel vacuum fluorescent display with multi-lingual capability (Language options include: English, Spanish, French, German, Russian. This is a partial listing. Contact AMETEK for more information.)

2 isolated analog outputs (0/4-20 mA) (Two additional analog outputs optional)
8 dry relay contacts (NO, 100VA, 240 V)
RS-485 isolated (supports MODBUS RTU)
RS-232 non-isolated

Fast Ethernet (IEE802.3)

**Utility Requirements**

Electrical:
120 VAC (105 to 132 VAC), 47 to 63 Hz
240 VAC (209 to 264 VAC), 47 to 63 Hz

Power Consumption:
< 700 W with oven heater
< 300 W without oven heater

**Environmental Requirements**

Ambient Temperature: -20 to 50°C (-4° to 122°F) without external heating or cooling

Ingress Protection:

IP65 and NEMA

**Enclosure material:** Stainless steel

**Physical Dimensions**

(W x H x D): 78 cm x 53 cm x 30 cm (30.7” x 20.9” x 11.8”)

**Weight:** 66 kg (145 lb) for base system

**Approvals and Certifications**

NEC/CEC General Safety requirements, CE & IP65, type 4

Standard General Purpose model:

NEC/CEC Class I Div 2 A, B, C, D; Class II Div 2 F & G; Class III

Zone 1/Div 1 option:

NEC/CEC Class I Div 1 A, B, C, D; Class II Div 1 F & G; Class III (pending)

1. *These specifications are based on normal operation of the analyzer as described in the manual supplement. Normal analyzer operation may include periodic zeroing and spanning.*

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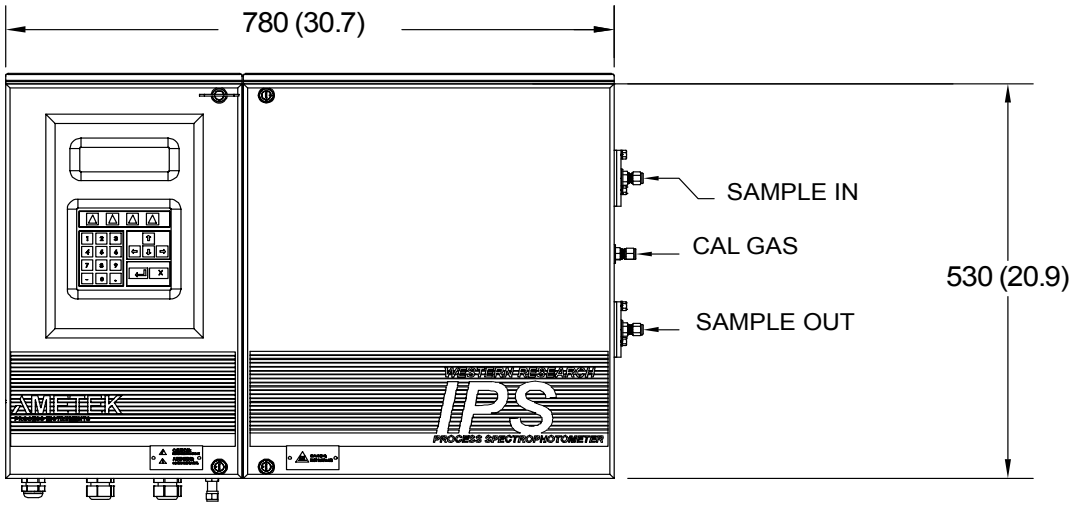


**FRONT VIEW**

*General Purpose Model Shown*


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*One of a family of innovative process analyzer solutions from AMETEK Process Instruments.*
*Specifications subject to change without notice.*

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