



## **Phase Dynamics**

*Technology for Precision Measurements*

Phase Dynamics, Inc.  
1251 Columbia Drive  
Richardson, TX 75081 USA  
E-Mail [sales@phasedynamics.com](mailto:sales@phasedynamics.com)  
Tel: 972-680-1550  
Fax: 972-680-3262

### *Parts Per Million Water-In-Oil Analyzers*



- **10 ppm to 1,000 ppm Water**
- **1/2" Flow-Through Tubing Connections**
- **High Pressure - to 3,000 psi**
- **On-Line Measurement**
- **Recovers from 100% Water Without Damage to Sensor**
- **Responds Quickly to Increasing Water Content**
- **Zero Check With Molecular Sieve**

- **CSA, FM, ATEX & PED**
- **RTD Temperature Measurement**
- **Configurable 4-20mA & Alarm**
- **Density Measurement**
- **Loop Flow Rate Indication**

- **USB Data Logging capability**
- **Color Touch Screen Interface**
- **Modbus RTU, HART**
- **24 VDC, 120 VAC and 230 VAC**

Typically used for measurement in liquid condensate lines, olefin processing and ppm level of water in hydrocarbons. It is used to determine when incoming product exceeds required moisture levels. The analyzer can also be used to detect heat exchanger break through to protect expensive catalyst beds. A 10 psi pressure drop will assure appropriate flow rates of 3 to 7 liters per minute. Zero validation with a molecular sieve

bed switched in before the analyzer. Phase Dynamics' Analyzers offer the most reliable, maintenance free measurement possible. The system utilizes the patented, "Oscillator Load Pull" microwave technology which provides the reproducibility and accuracy required for these applications. This technology coupled with the Company's patented use of aluminum oxide beads provides the process measurement.

All functions of the analyzers are accessed through use of an Operator Interface System which includes a Color Touch Screen. Output is MODBUS-RTU and 4-20 mA. Full digital access to the information including an on board USB logging is standard.

## PPM Water Analyzer Operational Specifications

PARAMETER	Range	Comments
RANGE	10 ppm to 1,000 ppm	Response Time is Determined by Flow Rate
UNCERTAINTY	20 ppm	
REPEATABILITY	+/- 10 ppm	
RESOLUTION	1 ppm	
FLUID TEMPERATURE	32 - 300° F	
FLOW RATE	3 to 7 liters/minute	
RESPONSE TIME (Minutes)	10 minutes	To Achieve 80% of Final Value – Responds within seconds for a step change in water

## System Specifications

### Measurement Section:

Construction:  
316/316L Standard; Other Materials Available;  
Designed and Fabricated per ASME B31.3 &  
ASME IX; Full Material Certifications Optional

Certifications:  
CSA Class 1, Div. 1, Groups C&D  
FM Approval  
CE Mark, Ex II 2 GD  
Ex d IIB T5

Process Connections:  
0.5 inch Tubing, Swagelok or Gyrolok

### Electronics Enclosure:

4 Conduit Entry Explosion Proof Enclosure:  
17.4 H x 14.0 W x 9.9 D inches; 59 lbs., NEMA  
4X,7,9  
Class 1, Div. 1, Groups C & D; Ex d IIB T5

### Outputs & Alarms:

Outputs Analog: 4-20mA, Enhanced 1each,  
Expanded 5 each  
Outputs Digital: 4 MODBUS RTU  
  
Includes Field Definable Relay, NO or NC Rated 1A,  
120V  
System Error Relay, NO or NC, Rated 1A, 120 V

### Process/Ambient Temperatures:

Fluid Temperature Compensation:  
Automatic with Built-in RTD Temperature Probe  
  
Ambient Temperature Ranges:  
Measurement Section: -40° to +130° F  
Electronics: +32° to +130° F  
- 40° to +130° F (With Optional Heater)  
  
Operational Fluid Temperatures:  
Standard 32° to 220° F, Optional 32° to 300° F

### Cables:

Between Standard Analyzer Measurement Section  
and Electronics Enclosure:  
Dedicated 19 Conductor, 22 AWG, 3 Twisted Pairs,  
1/2" Diameter, Special Factory installed Military  
Connector installed in Flexible Conduit 316  
Stainless Steel with glands.

### Certifications:

Explosion Proof Enclosures; CSA, FM, ATEX/PED  
(Optional)  
NACE MR0175

### Power Requirements:

18-28 VDC  
120-230 VAC 50-60 Hz (Optional)  
16 Watts Typical, 29 Watts Maximum, 36 Watts  
Expanded