# Thermo Scientific
# AquaPro Multi-Input Process Analyzer

## Accurate, user-friendly in-line monitoring

Thermo Scientific™ AquaPro™ provides accurate, user-friendly in-line monitoring of process applications — from power generation to municipal water and wastewater.

## Markets

- Power Generation
- Pulp and Paper
- Bottled/Municipal Water
- Wastewater
- Process Water
- Industrial Water

## Applications

- High-Purity Applications to Wastewater Effluent
- Rugged Industrial Environments
- Process Optimization and Control Applications

### Versatile and Flexible

The AquaPro Multi-Input Intelligent Process Analyzer is far more than a 4-wire multi-input meter. It is a sophisticated and highly flexible analysis platform for a wide range of process applications.

With up to four inputs or parameters, a user-friendly interface and easy-to-use menus in seven languages, the AquaPro meets the needs of complex process operations worldwide.

### Advantages:

- Large color display
- Up to four sensor inputs
- Up to eight current outputs
- Up to six alarm/control relays
- Multiple digital communication protocols
- Broad sensor compatibility
- Seven user-selectable languages

**Thermo**
**SCIENTIFIC**

### Detailed Process Information at a Glance

Displaying the status of up to four parameters simultaneously, AquaPro provides a complete picture of process status on a single instrument. This multi-channel capability reduces both the number of meters required and the time required for installation, maintenance and upgrades.

AquaPro's large 4.3" (109.22 mm) backlit color display leads the industry in visibility and ease of use. Color error-warning flags are visible in any lighting conditions.

The unit is built for the realities of utility and industrial operations. With a UV-resistant polycarbonate material case and NEMA 4X, IP66 waterproof rating, AquaPro can be pipe-, panel-, or wall-mounted in the most punishing work environments and the built-in USB data port makes it simple to download measurement data or upload new software in the field or on the factory floor.

### An Analyzer for Today and Tomorrow

Users select from seven languages — English, Spanish, French, German, Italian, Portuguese, and Chinese — and configure the AquaPro via clear, plain-language menus. Operation is straightforward and intuitive for all parameters — from basic pH measurements to complex free chlorine.

AquaPro provides simple interface to PLC, SCADA and other PC-based control systems and compatibility with all current industry data communication protocols — MODBUS® RTU over RS485 or RS232, DeviceNet™, Profibus™, Ethernet/IP, Modbus TCP, and CANopen®. It can be easily updated to support any future protocols using our unique modular design.

AquaPro is fully compatible with a wide range of liquid analytical sensors — both analog and digital — allowing measurement of many parameters, including:

- pH/ORP
- Conductivity (including resistivity, concentration, salinity and TDS)
- Dissolved oxygen
- Dissolved ozone
- Free chlorine
- Turbidity
- Suspended solids

## Growing with You

The AquaPro is ready for today's most diverse process analysis tasks. With its modular design, it is also designed to grow and adapt as needs evolve:

**Additional capacity:** With up to four sensors — analog or digital — per instrument, users can monitor more parameters by simply adding plug-and-play cards.

**Field-configurable upgrades:** Using the USB data port, new firmware can be quickly installed via removable digital storage media. This means new features and capabilities without changing hardware

**Quick configuration:** The configuration of an existing unit can be easily saved and copied to a newly installed unit using removable USB data storage media.

**Flexible communication:** Supporting all major communication protocols, AquaPro can be used with a wide range of data systems for different applications.

**Local languages:** With seven user-selectable languages, the AquaPro is ready to go wherever new facilities go online.
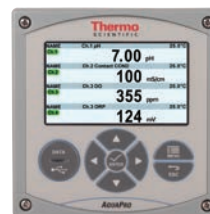
### Product Specifications

1. The analyzer shall be a modularly designed system capable of up to four measurement parameters with either analog or digital sensors.

2. The analyzer shall be a microprocessor based system.

3. The analyzer shall have a 4.3 inch (109.22 mm) 24bit full color backlit display.

4. Enclosure shall be ½ DIN format and NEMA4X and IP66 rated.

5. The analyzer shall be wall, pipe or panel mountable.

6. The analyzer shall be available in either 100-230 VAC or 24 VDC.

7. The analyzer shall have two 0/4-20 analog outputs per channel (Max of 8) and have integral PID control.

8. The analyzer must be able to accept either DataStick digital sensors or industry standard analog sensors for pH, Conductivity (2 electrode and Toroidal), Dissolved Oxygen, ORP, and Ozone in all 4 channels.

9. The analyzer shall have optional communications modules for MODBUS 232, MODBUS RTU, Ethernet IP TCP/IP, DeviceNet, CANopen, and Profibus DP/V1.

10. The analyzer shall be capable of up to seven different languages.

11. The analyzer must be capable of logging 1,000 data points at adjustable times and must be in a standard comma delimited file extractable through the front USB port.

12. The analyzer must be able to update system firmware through the front panel and internal USB ports.

13. System configuration must be able to store, transfer and update through front panel USB port.

14. The analyzer shall be a Thermo Scientific AquaPro Universal Analyzer.

### AquaPro Analyzer Dimensions
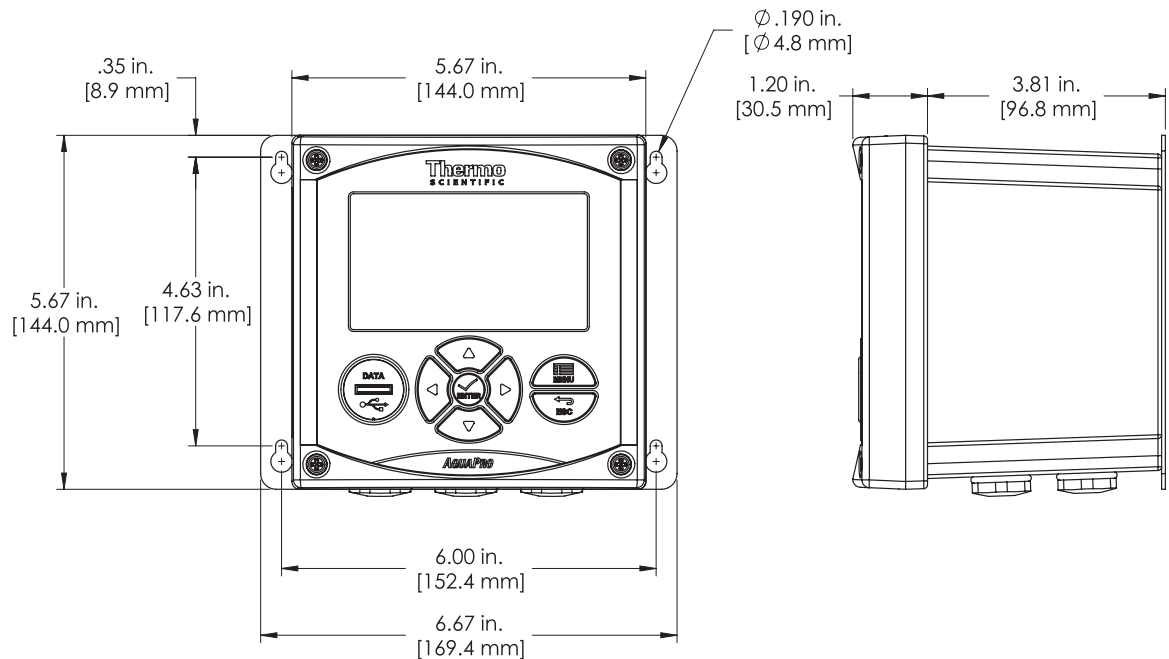
## Configurable Analyzer Platform (1 to 4 Sensors): pH, ORP, Conductivity, Dissolved Oxygen, Ozone, Turbidity, Free Chlorine, Suspended Solids

### Functions and Features

- One to four Sensors for optimal cost per measurement point.

- Temperature measurement for all sensors (standard).

- NEMA 4X Enclosure for indoor/outdoor use.

- Wall, Pipe and ½ DIN Panel Mounting options.

- Very readable large color graphics display.

- Math Functions for % rejection, % pass and others.

- Data and Event Logs for 4 channels for 30 days (Standard).

- Front panel USB port for easy data log extraction, quick system configuration, field software upgrades.

- Calibration, System Setup, Diagnostics and Service Menus.

- Two 4-to-20 mA loop outputs per sensor (up to 8).

- Three Form C Relays for Alarm, Control and Wash (Standard).

- Option for total of six Form C Relays when up to three sensors are used.

- Full Featured PID function for process control.

- Digital protocol options for remote measurement, calibration, setup and diagnostics: MODBUS, DeviceNet, Ethernet/IP.

- Six cable ports for standard conduit and cordgrip fittings.

### Mounting Options

- Wall Mount with Quick Disconnect mounting plate.

- ½ DIN Panel Mount.

- Pipe/Hand rail mount (vertical and horizontal).

### Interface

- Display: 4.3 Inch (109.22 mm) Color Graphics with High Contrast

- Keypad: 7 Key menu navigation

### Environmental Conditions

- Ambient operating temperature range: -20 to 60 °C

- Ambient storage temperature range: -20 to 70°C

- Maximum Relative humidity: 95% non-condensing

- Meets NEMA 4X requirements for outdoor use.

- Meets CE requirements for industrial use.

### Interchangeable Modules

Factory installed function cards can be reconfigured in the field.

Slot 1: pH, ORP, Conductivity, DO, Ozone, Turbidity, Chlorine, SS

Slot 2: pH, ORP, Conductivity, DO, Ozone, Turbidity, Chlorine, SS

Slot 3: pH, ORP, Conductivity, DO, Ozone, Turbidity, Chlorine, SS

Slot 4: pH, ORP, Conductivity, DO, Ozone, Turbidity, Chlorine, SS, Host Comms, 3 Optional relays.

### 4 to 20 Milliamp Current Loops

- Two isolated current loops per sensor (standard).

- Setup as 0 / 4-to-20 mA.

- 0.01mA Resolution.

- Each output assignable to sensor, temperature or Math.

- Full featured PID control function w/ pH or conductivity.

- Loop power provided by AquaPro

### Relays

- Three Form C Relays (Standard): 5A, 250 Volt.

- Three Form C Relays (Optional): 5A, 250 Volt.

- Normally Open and Normally closed contacts.

- Assignable to any measurement, temperature or math function in the system.

- Setup Functions Include: Alarm, Control and Timer.

### Digital Protocol Options to Host
- MODBUS RTU

- DeviceNet

- Profibus DP/V1

- Ethernet/IP

### Power Supply

AC Power Option: 100 to 240 VAC, 50/60Hz, 0.4A Max @ 25°C

DC Power Option: 24 VDC.

### Approvals

CE: EN6100 -4-2, -4-3, -4-4, -4-5, -4-6, -4-11

UL: cULus, Haz Loc Class 1 Div 2, Groups A,B,C,D.

## Model Number Configuration

**Model Number Base**

**AP** AquaPro enclosure with color graphics display, data logging functions and simple menu navigation for up to 4 sensors and 1 derived measurement. The enclosure is rated for outdoor use. Mounting options include ½ DIN Panel Mount, Wall Mount and Pipe Mount. There are two isolated current outputs per channel parameter. Three relays standard. Three additional relays optional. Front panel USB port for data transfer, auto configuration and software feature upgrades.

**Channel 1**
1   pH (Combination or Differential)
2   ORP (Combination or Differential)
3   Contacting Conductivity (Cell Constants: 1.0, 0.1, 0.05, and 0.01).
4   Toroidal Conductivity
5   Dissolved Oxygen (PPM)
6   Ozone
7   RDO Pro® Dissolved Oxygen
8   DataStick Digital Sensors: pH; ORP; Contacting Conductivity; Toroidal Conductivity; Low Turbidity; Dissolved Oxygen PPM; Dissolved Oxygen PPB; High Turbidity; Ozone; Free Chlorine; Suspended Solids.

**Channel 2**
X   Not Installed
1-8   Same as Channel 1

**Channel 3**
X   Not Installed
1-8   Same as Channel 1

**Channel 4**
X   Not Installed
1-8   Same as Channel 1
A   Host Communications with MODBUS (RS-232)
B   Host Communications MODBUS RTU (RS-485)
C   Host communications Ethernet IP, TCP/IP, Modbus TCP, HTTP, PC3
D   Host Communications DeviceNet
E   Host Communications CANopen
F   Host Communications Profibus
G   Three Additional Relays for process control

**Power and Standard Functions**
J   24 VDC with 3 relays
K   90 to 240 VAC with 3 relays

| AP | | | | | | | **In-Line Part Number** |
|----|--|--|--|--|--|--|--|

**Analyzer Performance Data**

## Standard Inputs for Sensors with DC Signals

| Measurement | Range | Resolution | Electrical Accuracy | Units |
|---|---|---|---|---|
| pH | 0 to 14 pH | 0.01 pH | 0.1mV | pH |
| ORP | -2000 to +2000m V | 1mV | 0.1mV | mV |
| Dissolved Oxygen | 0 to 20 ppm | 0.1 ppm | 0.1mV | ppm |
| Ozone | 0 to 10 ppm | 0.01ppm | 0.1mV | ppm |
| Temperature** | -5 to 200°C | 0.1°C | 0.1°C | °C/°F |

## Standard Inputs for Conductivity Sensors

| Measurement | Range | Resolution | Electrical Accuracy | Units |
|---|---|---|---|---|
| Toroidal | 0 to 2 S/cm | 1 uS/cm | 1 uS/cm | |
| 1.0 Cell | 0 to 2000 uS/cm | 0.1 uS/cm | 0.5 uS/cm | uS/cm, M Ω*cm, ppm, % |
| 0.1 Cell | 0 to 500 uS/cm | 0.01 uS/cm | 0.1 uS/cm | uS/cm, M Ω*cm, ppm, % |
| 0.05 Cell | 0 to 100 uS/cm | 0.01 uS/cm | 0.05 uS/cm | uS/cm, M Ω*cm, ppm, % |
| 0.01 Cell | 0 to 20 uS/cm | 0.001 uS/cm | 0.005 uS/cm | uS/cm, M Ω*cm, ppm, % |
| Temperature** | -5 to 200°C | | 0.1°C | °C/°F |

## Standard Inputs for Digital Sensors

| Measurement | Range | Resolution | Units |
|---|---|---|---|
| pH | 0 to 14 pH | 0.01 pH | pH |
| ORP | -2000 to +2000m V | 1mV | mV |
| Toroidal | 0 to 20 ppm | 1uS/cm | uS/cm, M Ω*cm, ppm, % |
| 1.0 Cell | 0 to 2000 uS/cm | 0.1 uS/cm | uS/cm, M Ω*cm, ppm, % |
| 0.1 Cell | 0 to 500 uS/cm | 0.01 uS/cm | uS/cm, M Ω*cm, ppm, % |
| 0.05 Cell | 0 to 20 ppm | 0.01 uS/cm | uS/cm, M Ω*cm, ppm, % |
| 0.01 Cell | 0 to 10 ppm | 0.001 uS/cm | uS/cm, M Ω*cm, ppm, % |
| Low Turbidity | 0 to 100 NTU | 0.001 NTU | NTU |
| High Turbidity | 0 to 4000 NTU | 0.1 NTU | NTU |
| DO (ppm) | 0 to 20 ppm | 0.1ppm | PPM |
| DO (ppb) | 0 to 20 ppm | 0.001 ppm | PPB, PPM |
| Ozone | 0 to 5 ppm | 0.1 ppm | PPM |
| Free Chlorine | 0 to 5 ppm | 0.1 ppm | PPM |
| Suspended Solids | 0 to 20,000 ppm | 1 ppm | PPM, % |
| Temperature | -5 to 200°C | 0.1°C | °C/°F |

**PT1000 temperature elements are standard on all Thermo Scientific branded process analytical sensors. Accuracy and resolution of other temperature elements (EG: PT100) will vary. Signal accuracy is based on external digital measurement system.

## Thermo Scientific AquaPro Multi-Input Process Analyzer

**Global support**—with experience that comes from supporting our customers for over 35 years throughout the world, our water quality specialists and customer support teams offer a quick, thorough and professional response to any problem encountered.

**Focus on user benefits**—we work closely with you to define your needs, and ensure you are using the monitor in a way that improves your bottom line. For more information, contact your local water quality specialists or visit: www.thermoscientific.com/processwater.

### Ordering Information

#### AquaPro Parameter Cards

| CML | Description |
|-----|-------------|
| AP01PH | AquaPro pH Card |
| AP02ORP | AquaPro ORP Card |
| AP03CC | AquaPro Contacting Conductivity Card |
| AP04TR | AquaPro Toroidal Conductivity Card |
| AP05DO | AquaPro Dissolved Oxygen Card |
| AP06OZ | AquaPro Ozone Card |
| AP07RDO | AquaPro RDO Pro (Optical) Dissolved Oxygen Card |
| AP08DS | AquaPro DataStick Digital Input Card |

#### AquaPro Communication and Options Cards

| CML | Description |
|-----|-------------|
| AP0AMB232 | AquaPro MODBUS 232 Communications Card |
| AP0BMBRTU | AquaPro MODBUS RTU Communications Card |
| AP0CETH | AquaPro Ethernet Communications Card |
| AP0DDEN | AquaPro DeviceNET Communications Card |
| AP0ECAN | AquaPro CANopen Communications Card |
| AP0FPROBS | AquaPro Profibus Communications Card |
| AP0GREXC | AquaPro relay Expansion Card |

Part numbers are of common configuration for common applications.

Please use the configuration tool on page 6 to customize your AquaPro to meet your needs.

**thermoscientific.com/processwater**

S-AQUAPRO-E 1014 RevC

### sold and serviced in Canada by:

**IC Controls**
Process Water Analysis Equipment since 1979

ISO 9001 2008

**www.iccontrols.com**
**sales@iccontrols.com**
**Phone: (519) 941-8161, (800) 265-9161**

**Thermo**
SCIENTIFIC
A Thermo Fisher Scientific Brand