

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

ABB

AP303/21021001/STD

COMBINATION PH SENSOR

Used with the applicable ABB AP300 analytical sensors configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: ABB official manufacturer documentation

ABB MEASUREMENT & ANALYTICS | DATA SHEET | DS/AP300-EN REV. J

AP300

Combination pH/Redox (ORP) sensors



Measurement made easy

A reliable economic solution for a wide range of applications

Long life

- large PTFE junction provides resistance to fouling
- double junction with gelled electrolyte provides better-defined junction potentials, creating an inherently-stable reference junction that is resistant to poisoning

High accuracy

- specially formulated, low sodium-error glass for accuracy at high pH
- temperature sensor positioned perfectly to compensate for measurement and reference element temperature, ensuring rapid compensation and process temperature tracking

High reliability

- operates up to 105 °C (221 °F) and 6 bar (90 psi) @ 25 °C (77 °F)
- fouling-resistant flat glass available

High flexibility

- suitable for a wide range of applications
- available for insertion, immersion, flow-through and hot-tap
- standard- and blue-glass options
- bulb and flat-glass options

Economical

- cost-effective
- long life
- highly reliable

...Insertion, flow-through, immersion (dip) and hot-tap

AP302 and AP303

General-purpose insertion, flow-through, immersion, 3/4 in. NPT threaded sensors.

The AP302 and AP303 are constructed from PVDF (Kynar) and can be used in insertion, flow-through or immersion (dip) applications.

AP302 models have no sensor guard (flush) for use with flat glass to provide a flow-cleaned configuration.

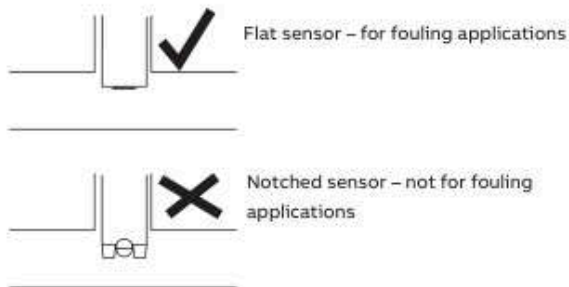
AP303 models have a notched sensor guard to protect the bulb glass.



AP303 notched sensor

Flat / Notched sensor

Notched sensors are provided to protect the bulb glass and are especially suited to retractable and immersion sensors.



Applications for sensor styles

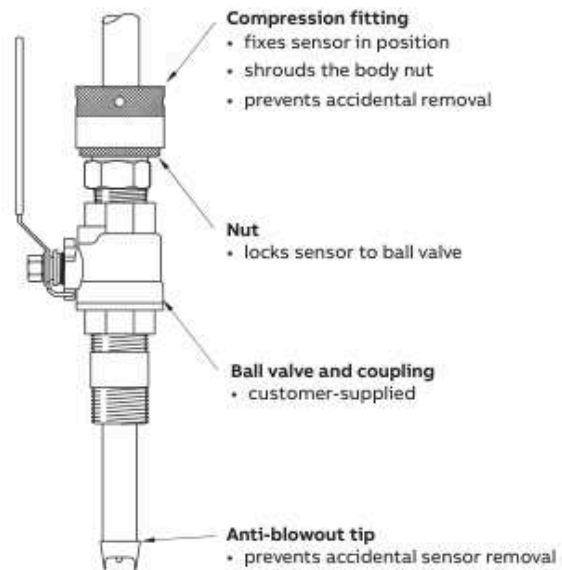
AP304 and AP305

General-purpose, hot-tap retractable sensors.

Completing the series, the AP304 and AP305 are fully-retractable PVDF stainless steel-clad sensors. With these sensors, project and maintenance costs can be reduced significantly as the need for expensive by-pass systems or long immersion sensors are eliminated.



Hot-tap retractable sensor

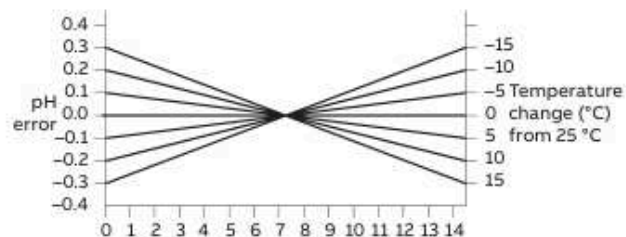


AP304 and AP305 anti-blowout tip and hand-compression fitting safety features

Temperature compensation

The AP300's temperature compensator offers fast response and high accuracy. The temperature sensor is located at the tip of the AP300, together with the measuring and reference electrodes. This arrangement provides accurate process temperature measurement used to compensate for the effects of temperature on the electrodes to produce a precise pH measurement.

The temperature compensator is available as Balco 3k or Pt100.



Temperature compensation

Flat-glass

The flat end and glass design promotes self-cleaning and provides maximum resistance to fibrous build-up.



Flat and bulb glass variants

Glass options

The AP300 range is available with ABB's specially formulated standard pH-sensitive glass or, optionally, with low-resistance glass that speeds up the response of the sensor by an order of magnitude at temperatures below 60 °C (140 °F). For applications with higher pH levels and temperatures, ABB's standard glass offers a much lower sodium error than competing products; enabling the sensor to maintain its accuracy even at very high pH levels, when sodium ions would otherwise cause inaccurate readings.

Sodium error at 25 °C (77 °F): 0.02pH in 1M NaOH



ABB-manufactured electrodes

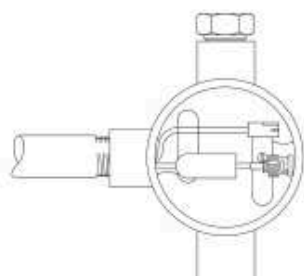
Cable options

Several connections are possible from the probe. An integral cable with tagged pins for direct connection to a transmitter or a male BNC connector for connection to an extension cable. Both tagged and BNC cables are available in versions that accommodate temperature signals. Cables are available in short, junction box-only lengths and in 5, 10, 20 and 30 m (16, 33, 66 and 98 ft.) lengths.

Without temperature compensator

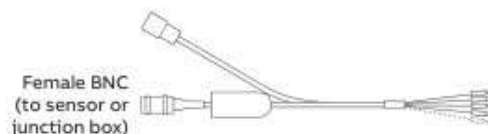
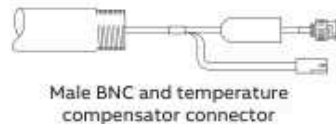


Junction box



Junction box
(4TB5023-0162)

With temperature compensator

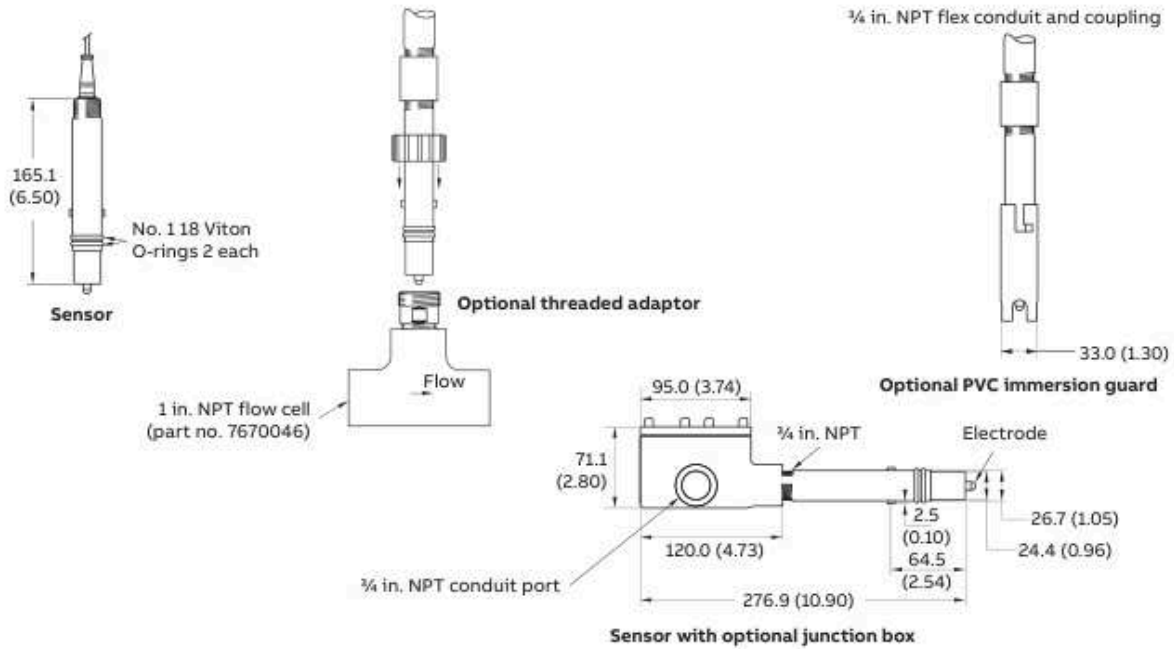


Tagged pin extension cable
5-core to AX400:
1015 160 5 m
1015 161 10 m
1015 162 20 m
1015 163 30 m

Overall dimensions

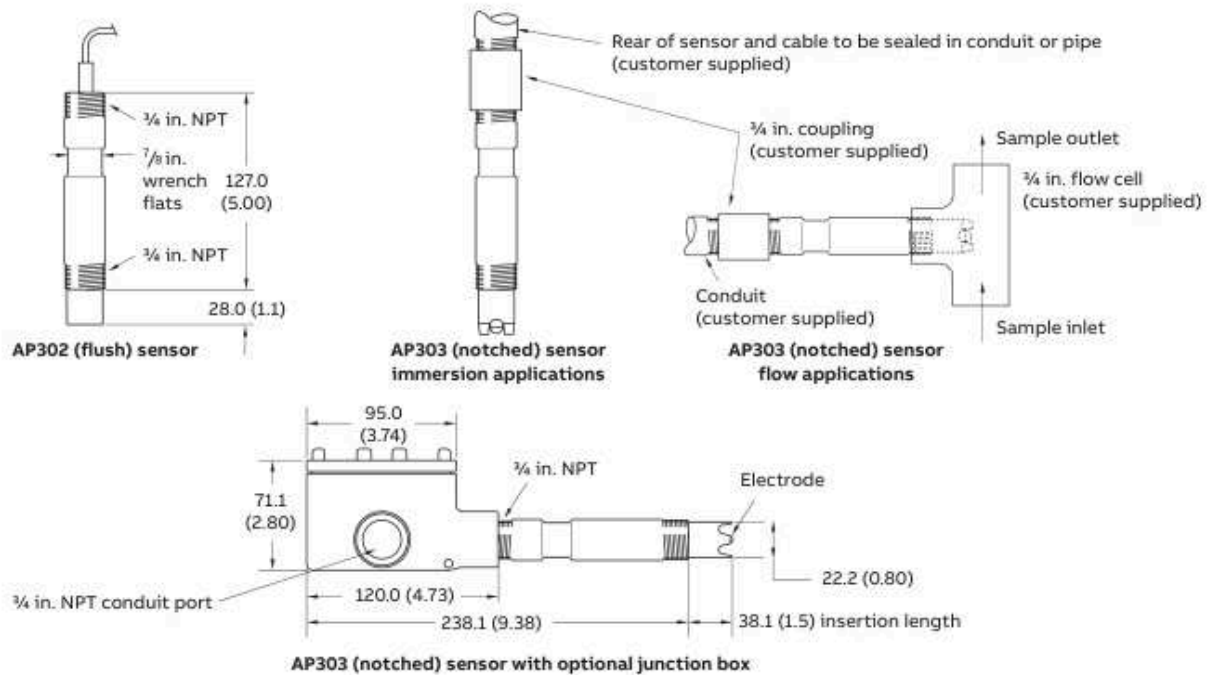
AP301

Dimensions in mm (in.)



AP302 and AP303

Dimensions in mm (in.)



Specification

General

pH measuring range

- Standard (yellow glass) 0 to 14 pH
- Low temperature (blue glass) 0 to 10 pH

Redox (ORP) measuring range

–2000 to 2000 mV

Temperature range

- Body 0 to 105 °C (32 to 221 °F)
- Bulb glass 0 to 105 °C (32 to 221 °F)
- Flat glass 5 to 100 °C (41 to 212 °F)
- Blue glass –5 to 60 °C (23 to 140 °F)
- Redox (ORP) 0 to 105 °C (32 to 221 °F)

Pressure maximum

6 bar (90 psi) @ 25 °C (77 °F)

Temperature compensator (pH sensors only)

Integral Pt100 or Balco 3 kΩ

Wetted materials

- | | |
|---|-----------------|
| • pH electrode | Glass |
| • Redox (ORP) electrode | Platinum |
| • Junction | PTFE |
| • Body AP301 | PPS (Ryton) |
| • Body AP302/3 and AP304/5 | PVDF (Kynar) |
| • Flow cell | PVC |
| • Immersion guard | PVC |
| • AP304 and AP305 shaft and compression fitting | Stainless steel |

pH glass types

- Bulb general duties
- Flat in-line, self-cleaning
- Blue low temperature

Reference system

Ag/AgCl-3.5M KCl in gel matrix

Reference junction

Porous PTFE

Spares and accessories

Threaded lock-nut adapter, PPS (Ryton)
(1 in. NPT)

4TB9515-0120

PVC Immersion / dip guard

4TB5205-0120

Junction box (requires cable gland)

4TB5023-0162

Cable gland

4TB9515-0244

Flow cells

1 in. NPT (for adapter) +

7670 046

1 in. NPT (for process connection)

1 in. NPT (for adapter) +

7670 043

1 in. BSPT (for process connection)

Flow cell pipeline adapters

1 in. BSPT to ½ in. BSPT polypropylene

7601 420

1 in. BSPT to ½ in. NPT polypropylene

7601 430

Extension cables

Tagged pin extension cables

(5-core 1015/16X for AX460 and AX466)

5 m (16 ft)

1015 160

10 m (33 ft)

1015 161

20 m (66 ft)

1015 162

30 m (98 ft)

1015 163

Buffer sachets (box of 25)

4 pH

0400/110

7 pH

0400/120

9 pH

0400/130

Buffer sachets (mixed box of 10 of each)

4, 7 and 9 pH

0400/135

