



Eurotherm®

AP1 Carbon Probe

In-Situ Carbon Probe for Carbon Control Systems

Benefits

- In-situ atmosphere measurement
- Repeatable product quality
- Energy cost savings
- Improved Overall Equipment Effectiveness (OEE)

Key features

The AP1 In-Situ Carbon probe offers:

- High repeatability
- A burn-off port as standard
- Rapid response
- Measurement with Thermocouple Types K, R, S, N, or without a thermocouple
- Compatibility with a wide range of process controllers

eurotherm.com/ap1probe

 **WATLOW®**
Powered by Possibility

AP1 Carbon Probe

The AP1 In-Situ Carbon probe is a direct and continuous carbon potential probe. It uses a patented design which features a cylinder of special zirconium oxide formulation, welded into the end of an alumina tube by means of a eutectic welding process – the resultant homogenous structure provides a very robust design. The probe sheath is a high temperature special alloy with a flow-through tip design to minimize soot collection and maximize sensor response. External signal and thermocouple connections are made via a quick disconnect plug, this enables a quick and reliable installation.

The probe can measure very low oxygen partial pressures with extreme accuracy and repeatability. It can be used to control furnace atmospheres and gas generators over a full range of carburising and hardening applications.

Works in all common reducing atmospheres:

- Endothermic
- Nitrogen/methanol
- Nitrogen/natural gas
- Nitrogen/hydrogen
- Nitrogen/propylene

Operation

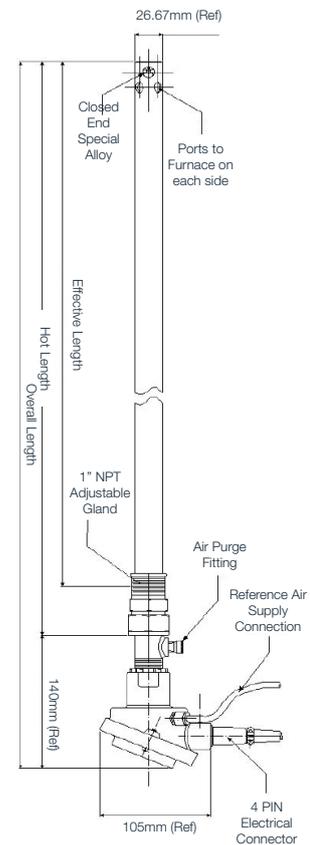
The AP1 probe is suitable for high temperature carburizing heat treating, carbonitriding and endothermic gas generators. It should not be used for nitriding applications.

An inlet port for the supply of reference air to the inner electrode is in the head of the probe, along with the electrical connections to the inner and outer electrodes. The probe is generally fitted with a thermocouple to give the process temperature within the probe tip region and is also fitted with a “burn-off” port to allow the burn-off of carbon/soot deposits on the sensor tip, as required.

Specifications

Probe Size	Effective Length (mm/inches)	Hot Length (mm/inches)	Overall Length (mm/inches)
AP1x-xx121	462 (18.2)	513 (20.2)	653 (25.7)
AP1x-xx124	539 (21.2)	590 (23.2)	730 (28.7)
AP1x-xx128	640 (25.2)	691 (27.2)	831 (32.7)
AP1x-xx132	742 (29.2)	793 (31.2)	933 (36.7)
AP1x-xx136	844 (33.2)	895 (35.2)	1035 (40.7)
AP1x-xx144	1049 (41.2)	1100 (43.3)	1240 (48.8)

Specifications	
Output	0.00V to 1.40V dc over operating range
Temperature range	760°C to 1050°C (1400°F to 1922°F)
10-90% response time	Less than 2s at temperature 760°C
Range of operation	Partial pressure of Oxygen down to 10^{-24}
Thermocouple	Types K, R, S, N and no thermocouple
Probe sheath	Special alloy – resistant to corrosion and oxidization up to 1050°C (1922°F)
Diameter of sheath	26.67mm (1.05in) O.D nominal
Aperture required	35mm (1.38in) minimum
Fitting detail	Screwed fitting 1 inch NPT Male Adjustable Gland
Minimum furnace insertion	75mm (2.95in)
Reference air flow	20ml/min (0.42 SCFH) to 700ml/min (1.48 SCFH) air 20.9% O ₂
DC measuring system	%Oxygen sensors should be used with a controlling, recording or indicating instrument having an input impedance of 10MΩ or higher



Ordering Information

No Thermocouple

AP10-00121	AP10 STANDARD 21"
AP10-00124	AP10 STANDARD 24"
AP10-00128	AP10 STANDARD 28"
AP10-00136	AP10 STANDARD 36"

With Thermocouple

AP11-00121	CAR PROBE PS TYPE K 21"
AP11-00124	CAR PROBE PS TYPE K 24"
AP11-00128	CAR PROBE PS TYPE K 28"
AP11-00132	CAR PROBE PS TYPE K 32"
AP11-00136	CAR PROBE PS TYPE K 36"
AP12-00121	CAR PROBE PS TYPE R 21"
AP12-00132	CAR PROBE PS TYPE R 32"
AP13-00121	CAR PROBE PS TYPE S 21"
AP13-00124	CAR PROBE PS TYPE S 24"
AP13-00128	CAR PROBE PS TYPE S 28"
AP13-00132	CAR PROBE PS TYPE S 32"
AP13-00136	CAR PROBE PS TYPE S 36"
AP13-00144	CAR PROBE PS TYPE S 44"
AP15-00128	CAR PROBE PS TYPE N 28"
AP17-00144	TYPE S T/COUPLE FOR 44" PROBE 30



LA031108

Length reduction collar carbon probe



E24-540

Socket Connector



A10727-200-06 K Type 4 COND W/Armour 6" Probe cable

A10727-200-12 K Type 4 COND W/Armour 12" Probe cable

A10727-200-18 K Type 4 COND W/Armour 18" Probe cable

A10727-300-06 R & S Type 4 COND W/Armour 6" Probe cable

A10727-300-12 R & S Type 4 COND W/Armour 12" Probe cable

A10727-300-18 R & S Type 4 COND W/Armour 18" Probe cable

A10727-500-06 N Type 4 COND W/Armour 6" Probe cable

A10727-500-12 N Type 4 COND W/Armour 12" Probe cable

A10727-500-18 N Type 4 COND W/Armour 18" Probe cable



A12337-200-06 K Type 4 CONDUCTOR 6" Probe cable

A12337-200-12 K Type 4 CONDUCTOR 12" Probe cable

A12337-200-18 K Type 4 CONDUCTOR 18" Probe cable

A12337-300-06 R & S Type 4 CONDUCTOR 6" Probe cable

A12337-300-12 R & S Type 4 CONDUCTOR 12" Probe cable

A12337-300-18 R & S Type 4 CONDUCTOR 18" Probe cable

A12337-500-06 N Type 4 CONDUCTOR 6" Probe cable

A12337-500-12 N Type 4 CONDUCTOR 12" Probe cable

A12337-500-18 N Type 4 CONDUCTOR 18" Probe cable

The AP1 Carbon Probe works well with:



EPC3000 Programmable Controller



nanodac™ Recorder/Controller



T2750 PAC



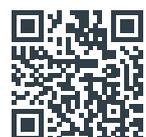
E+PLC400

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