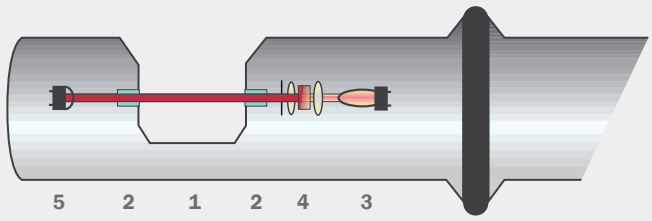
18 Probe Sensors AS16/AS56



② **Model AS16 (AS56)** Single Channel Absorption

1 OPL
2 Windows
3 Lamp module
4 Optics modules (incl. filter)
5 Detector module

No window gaskets used

Models AS16 and AS56 are high precision sensors measuring turbidity (AS16-N and AS56-N) or color (AS16-F and AS56-F) for use in various industries. The sensors are designed for inline operation and provide accurate concentration measurements with remarkable repeatability, linearity and resolution.

AS16

The AS16 series offers the high-end range of optek probe sensors. A wide selection of different optical path lengths and insertion depths combined with optional calibration filters and electro-polished stainless steel meet all requirements of the biotechnology industry.

AS56

The AS56, based on the same design as the AS16 with seal-less window construction, is typically used in food and beverage applications. Limited variations allow cost effective measurement (e.g., phase separation).

NIR-Absorption (Turbidity) VIS-Absorption (Color)

A special tungsten lamp produces a constant light beam that passes through the process medium. The attenuation of the light intensity, caused by absorption and/or scattering by dissolved and undissolved substances, is detected by a sealed silicon photodiode. The AS16-N and AS56-N uses light from 730 - 970 nm to measure solids concentration independent from color or color changes (e.g., yeast concentration in beer during tank draining).
The AS16-F and AS56-F uses a specific wavelength in the visible spectrum to measure color in liquids with little or no turbidity (e.g., beer in water during phase change).

OPL

Special optical windows are made from a single crystal sapphire, providing superior resistance to all abrasive and corrosive media. optek's superior manufacturing techniques allow mounting the windows without gaskets or glue for lifetime without maintenance. The appropriate choice of the optimal OPL (optical path length = distance between the windows) supports all measurement requirements, i.e., low/high measuring ranges at highest resolution.

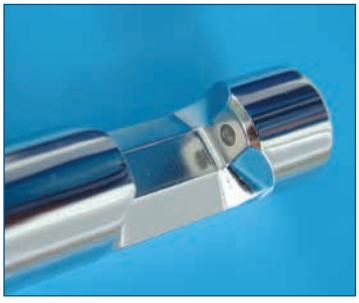
NIST-traceable

NIST-traceable calibration accessories (AS16 only) provide absolute measurement confidence (for details refer to page 27).

Typical Applications:

- *Cell density in fermentation (AS16-N)*
- *Milk/water phase separation (AS56-N)*
- *Beverage blending (AS16-F)*
- *Beer/water phase separation (AS56-F)*

See our TOP 5 brochures for applications in your industry.



optek AS16-N Single Channel Absorption Probe

optek AS16-VB-N
Single Channel Absorption Probe with Calibration Option

Technical Data	AS16	AS56
Measurement		
Measurement principle	1- Channel absorption of light	
Detector	1 silicon photodiode (hermetically sealed)	
Measurement wavelength	• AS16-N: 730 - 970 nm • AS16-F: 430, 550 or 620 nm	• AS56-N: 730 - 970 nm • AS56-F: 430 nm
Measuring range	AS16-N: any measuring range between 0 - 0.05 to 6 CU AS16-F: any measuring range between 0 - 0.05 to 2 CU (depending on wavelength)	AS56-N: any measuring range between 0 - 0.05 to 4 CU AS56-F: any measuring range between 0 - 0.05 to 1.5 CU
Optical path length	1, 5, 10, 20 or 40 mm	5 or 10 mm
Calibration	CU (concentration units) application specific calibration	
Light source	special incandescent tungsten lamp 5.0 V DC, 970 mA typical life span: 3 to 5 years (25,000 to 40,000 hours)	special incandescent tungsten lamp 5.0 V DC, 450 mA typical life span: 3 to 5 years (25,000 to 40,000 hours)
Resolution	< ± 0.05 % of respective measuring range	< ± 0.5 % of respective measuring range
Repeatability	< ± 0.5 % of respective measuring range	< ± 1.0 % of respective measuring range
Linearity	< ± 1 % of respective measuring range (specific to application)	< ± 2 % of respective measuring range (specific to application)
Protection	all optical parts have an IP rating of IP65 or higher	
Process Adaption		
Material	wetted parts: stainless steel 1.4435 (SS 316 L) dF < 1 %, BN2 surface: electro-polished Ra < 0.4 µm housing: stainless steel 1.4571 (SS 316 Ti)	wetted parts: stainless steel 1.4435 (SS 316 L) surface: electro-polished Ra < 0.8 µm housing: stainless steel 1.4571 (SS 316 Ti)
Port connection	thread G1-1/4 in., ISO 228/1 for port AS25 (similar Ingold-port) diameter: 25 mm (D= 25 H7) O-ring groove for 30 mm and for 60 mm port length	
Port gasket	O-ring 18.64 x 3.53 mm EPDM (FDA / USP Class VI)	
Insertion depth	35 mm (1.38 in.) + OPL at a port length of 60 mm (2.36 in.)	35 mm (1.38 in.) + OPL at a port length of 60 mm (2.36 in.)
	135 mm (5.31 in.) + OPL at a port length of 60 mm (2.36 in.)	n/a
Process pressure	10 mbar to 20 bar (0.15 psi to 290 psi)	10 mbar to 10 bar (0.15 psi to 145 psi)
Windows	sapphire (seal-less)	
Window gaskets	n/a	
Installation accessories	weld-in ports, Varivent adapter (50.00), clamp adapter (1.5 and 2.0 in.) optek T-pieces DIN 11850 (DN50 - DN100), optek T-pieces OD (BS4821-1) (2.0 - 4.0 in.)	
Temperature Ratings		
Process temperature	permanent: 0 - 100 °C (32 - 212 °F) peak 60 min/day: 0 - 150 °C (32 - 302 °F)	permanent: 0 - 90 °C (32 - 194 °F) peak 60 min/day: 0 - 100 °C (32 - 212 °F)
Ambient temperature	operation: 0 - 40 °C (32 - 104 °F) transport: -20 - 70 °C (-4 - 158 °F)	
Calibration		
Calibration adapter	none	n/a
Calibration adapter OPTION VB	Filter adapter FH03 for calibration filter used for sensor verification	n/a

Pressure and temperature ratings specified herein may be subject to limitations - see instruction manual.
The appropriate choice of material for all wetted parts is the sole responsibility of the user.
Data given are subject to changes without prior notice.

Installation accessories:


Tri-Clamp


Varivent


Weld-in port 15°


Weld-in port 0°


T-piece