

Optical Dissolved Oxygen Industrial Smart Probe

HI510 and HI520 Universal Process Controller compatible

The HI7640-58 is an optical dissolved oxygen probe with HI764113-1 Smart Caps for measurement of dissolved oxygen.

The probe is designed to work with the Hanna Instruments® HI510 or HI520 process controller. When paired with the controller, the system provides accurate dissolved oxygen measurements auto-compensated for barometric pressure, salinity (set manually), and temperature.

Suitable for control applications in aeration basins, ponds, and tanks where optimizing oxygen transfer is a key element, the probe can be submersed/immersed in a tank using the 3/4" NPT threads, or installed in a flow cell using the lower sensor threads.

Several extension cables can be purchased separately to cover up to 50 meter (164 ft) distance between probe and controller.

Principle of Operation

The method is based on the principle of fluorescence quenching and features an immobilized Pt- based luminophore that is excited by the light of a blue LED and emits a red light. Dissolved oxygen quenches this excitation. When there is no oxygen present, the lifetime of the signal is the greatest; as oxygen hits the sensing surface, the lifetime becomes shorter.

The intensity and lifetime are inversely proportional to the amount of oxygen present; as oxygen interacts with the luminophore it reduces the intensity and lifetime of the luminescence. The lifetime of the luminescence is measured by a photodetector, and is used to calculate the dissolved oxygen concentration. This is, in turn, reported by the controller as % saturation or mg/L of dissolved oxygen.

Over time, the sensor's optical components can age but are compensated for by using the reference signal to compensate the measuring path. As a result, the sensor provides accurate dissolved oxygen measurements over long periods of time without the need for frequent calibrations.

- Factory calibrated Smart Cap that stores data
- 3/4" NPT external thread at both ends
- Built-in temperature sensor for measurement
- Digital probe stores model, firmware, serial number, calibration information and Smart Cap data (serial number, installation date)
- Minimum maintenance (no electrolyte refill or membrane replacement)
- Measurement reliability independent of flow rate
- Reduced response time
- Stable readings even when oxygen concentration is low



Specifications		example HI7640-58zz
Dissolved Oxygen	Range	0.00 to 50.00 mg/L (ppm) concentration 0.0 to 500.0 % saturation
	Resolution	0.01 mg/L (ppm) 0.1% saturation
	Accuracy	from 0.00 to 20.00 mg/L (ppm): 1.5 % of reading or ± 0.01 mg/L (ppm), whichever is greater; from 20.00 to 50.00 mg/L (ppm): $\pm 5\%$ of reading from 0.0 to 200.0 % saturation: $\pm 1.5\%$ of reading or $\pm 0.1\%$, whichever is greater; from 200.0 to 500.0 % saturation: $\pm 5\%$ of reading
	Calibration	One or two points: at 100% and/or 0% or 8.26 mg/L and/or 0 mg/L in water-saturated air or zero-oxygen solution Single point process calibration: using value entered by the user in % saturation or mg/L
Temperature	Range	-5.0 to 50.0°C (23.0 to 122.0 °F)
	Resolution	0.1 °C; 0.1 °F
	Accuracy	$\pm 0.3\text{ °C}$ / $\pm 0.5\text{ °F}$
	Calibration	Single point offset (controller setting)
Temperature Compensation	Automatic	
Temperature source	Automatic (from probe) Manual	
Pressure Compensation	Automatic	420 to 850 mmHg
Salinity Compensation	Automatic	0 to 70 g/L (salinity factor set by user)
Body	ABS	
Sensor	Type	Optical DO
	Diameter	Ø 17 mm (0.7")
	Insertion length	43 mm (1.7")
Maximum Pressure	2 bar (29 psi) at 25 °C (77 °F)	
Threaded Connection	3/4" NPT external thread (both ends)	
Wetted Parts	Sensor body	PVDF
	Smart cap material	Polypropylene
	Dome-shaped membrane	PMMA
	O-ring	NBR
	Temperature contact	stainless steel
Protection Rating	IP68	
Cable Length	zz, see Ordering Information	

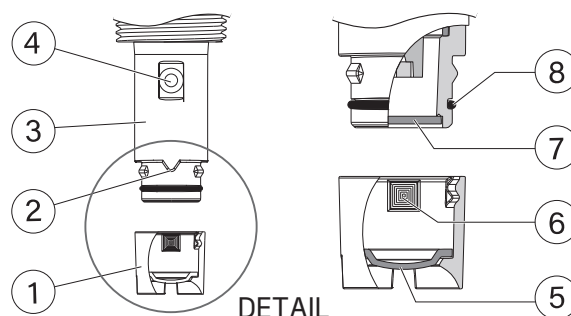
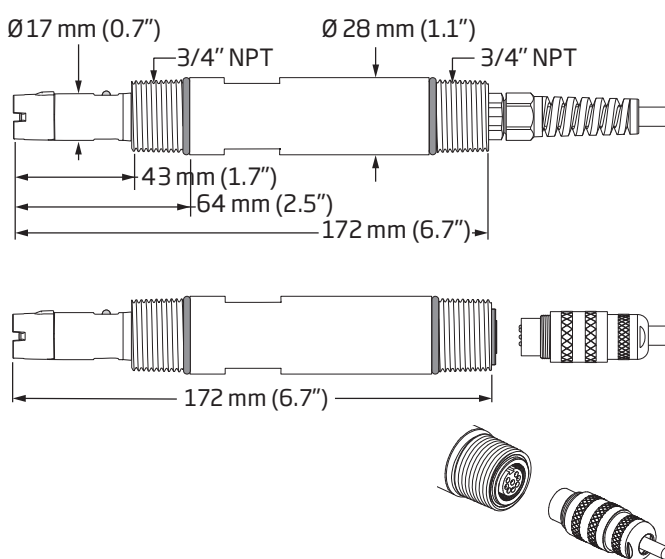
Ordering Information

Each probe is supplied with HI764113-1 DO Smart Cap with O-ring, protective cap, calibration beaker, sachet with silicone grease, syringe, and quick reference guide with probe quality certificate.

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Choose your configuration:		
5	Optical DO sensor	
8	Smart probe, with RS485 connection	
zz	00 supplied with DIN connector (without cable). See Accessories section for patch cable ordering codes. 05, 10, 15, 25, 50 fixed cable length (in meters)	
Accessories	HI764113-1	DO Smart Cap with O-ring
	HI76510-05	Patch cable, 5 m (16'5")
	HI76510-10	Patch cable, 10 m (32'9")
	HI76510-15	Patch cable, 15 m (49'2")
	HI76510-25	Patch cable, 25 m (82')
	HI76510-50	Patch cable, 50 m (164')

Dimensions



1. Smart Cap
2. Alignment Key
3. Probe Body
4. Temperature sensor
5. Embedded O₂ sensitive luminophore with rugged, insoluble black oxygen-permeable protective layer
6. Communication tag
7. Optical window
8. O-ring seal

Smart Cap



Smart Cap stores factory calibration coefficients.



The domed surface helps repel surface bubbles and provides increased luminophore surface area for better measurement sensitivity.