









More Precision

opto**CONTROL** CLS1000 // Fiber optic sensor for industrial applications



Sheath **T**


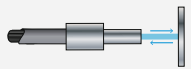
Please determine the sheath and the bonding of the optical fiber based on the prevailing environmental conditions and mechanical stress. Please contact us for high-temperature applications or use under extreme mechanical stress.

<p>Silicone-metal sheath Metal spiral hose with glass-fiber braiding and silicone rubber sheath ¹⁾</p> <p>Characteristics:</p> <ul style="list-style-type: none"> - Very flexible, ideal for frequent bends - Highly resistant to folding, tension and torsion; - Temperature-stable from -60 °C to +180 °C - Liquid-tight 	<p>VA stainless-steel sheath Flexible stainless steel spiral hose ¹⁾</p> <p>Characteristics:</p> <ul style="list-style-type: none"> - Flexible - Protection against mechanical stress - Temperature-stable to 400 °C - Stainless 	<p>Metal sheath Flexible brass spiral hose, chrome-plated ¹⁾</p> <p>Characteristics:</p> <ul style="list-style-type: none"> - Flexible - Protection against mechanical stress - Temperature-stable to 300 °C 
<p>PVC metal sheath Flexible brass spiral-reinforced hose coated with PVC sheath ¹⁾</p> <p>Characteristics:</p> <ul style="list-style-type: none"> - Flexible - Protection against mechanical stress such as pressure and tension - Temperature-stable from -20 °C to +80 °C 	<p>PVC special sheath Plastic hose ²⁾</p> <p>Characteristics:</p> <ul style="list-style-type: none"> - For rigid installation - Small sheath diameter - Temperature-stable to 80 °C 	<p>BOA special sheath Corrugated tube with stainless steel braiding ³⁾</p> <p>Characteristics:</p> <ul style="list-style-type: none"> - Protection against mechanical stress - Ideal for drag-chain applications - Temperature-stable from -50 °C to +600 °C 

¹⁾ Bending radius corresponds to three times the outer diameter of the sheath.
²⁾ Bending radius corresponds to twice the outer diameter of the sheath.
³⁾ Bending radius corresponds to at least 80 - 100 mm, depending on the outer diameter of the sheath.

Details about sheath diameters can be found in section 2.

Fiber bundle **2.5**

 <p>Range Transmission mode (typ.)</p>	90 mm	200 mm	500 mm	1700 mm	2000 mm
<p>Min. object size (typ.)</p>	0.05 mm	0.1 mm	0.1 mm	0.2 mm	0.3 mm
 <p>Range Reflex mode (typ.) *</p>	<p>Copper 35 mm</p> <p>Raw aluminum 24 mm</p> <p>Stainless steel 21 mm</p> <p>White, rough plastics 13 mm</p> <p>Mat black cardboard 6 mm</p>	<p>Copper 76 mm</p> <p>Raw aluminum 61 mm</p> <p>Stainless steel 50 mm</p> <p>White, rough plastics 33 mm</p> <p>Mat black cardboard 16 mm</p>	<p>Copper 217 mm</p> <p>Raw aluminum 164 mm</p> <p>Stainless steel 135 mm</p> <p>White, rough plastics 84 mm</p> <p>Mat black cardboard 44 mm</p>	<p>Copper 820 mm</p> <p>Raw aluminum 514 mm</p> <p>Stainless steel 412 mm</p> <p>White, rough plastics 260 mm</p> <p>Mat black cardboard 130 mm</p>	<p>Copper >1200 mm</p> <p>Raw aluminum 457 mm</p> <p>Stainless steel 415 mm</p> <p>White, rough plastics 260 mm</p> <p>Mat black cardboard 135 mm</p>
<p>Required fiber bundle øF</p>	0.6 mm	1 mm	1.5 mm	2.5 mm	3 mm

*Analog output 5 V and maximum amplification

Total length **1200**



Standard lengths are: 600*, 1200*, 1800 and 2400 mm.

* Bearing types

For CLS1000-xx also > 2400 mm possible.

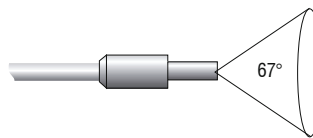
Length tolerance typ.: $\pm 4\%$

Cable lengths from 200 mm are available on request.

Recommended maximum cable length:

CLS up to max. 10,000 mm

Aperture angle **67°**



The standard aperture angle is 67°.

Other opening angles are also available on request, when physical feasibility is provided.

Maximum temperature range **T2000**

The glass fibers can be bonded in several stages for high temperature ranges. Standard bonding is suitable for temperatures up to 80 °C.

With special adhesives, temperatures of up to 250 °C can be reached in the first stage and up to 400 °C in the second stage. Special versions with temperature ranges up to 2000 °C (temperature at the sensor) are also available.

Vibration protection **VS**

For mechanical stresses such as impacts, accelerations and movements, the fiber optics can be manufactured with increased vibration protection. This special treatment reduces the friction between the fibers and absorbs shocks. The fibers are embedded in a gel cushion.

Suitability for drag chains **D**

For use in machines with moving parts, the internal structure of the fiber optic cables has been modified so that even when the minimum permissible bending radius is reached, the individual fibers are not damaged and error-free operation is achieved.

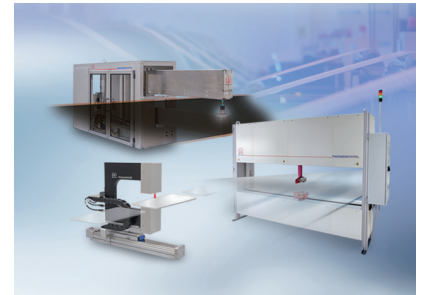
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