

**Strokemaster® Inductive Cylinder Sensors**

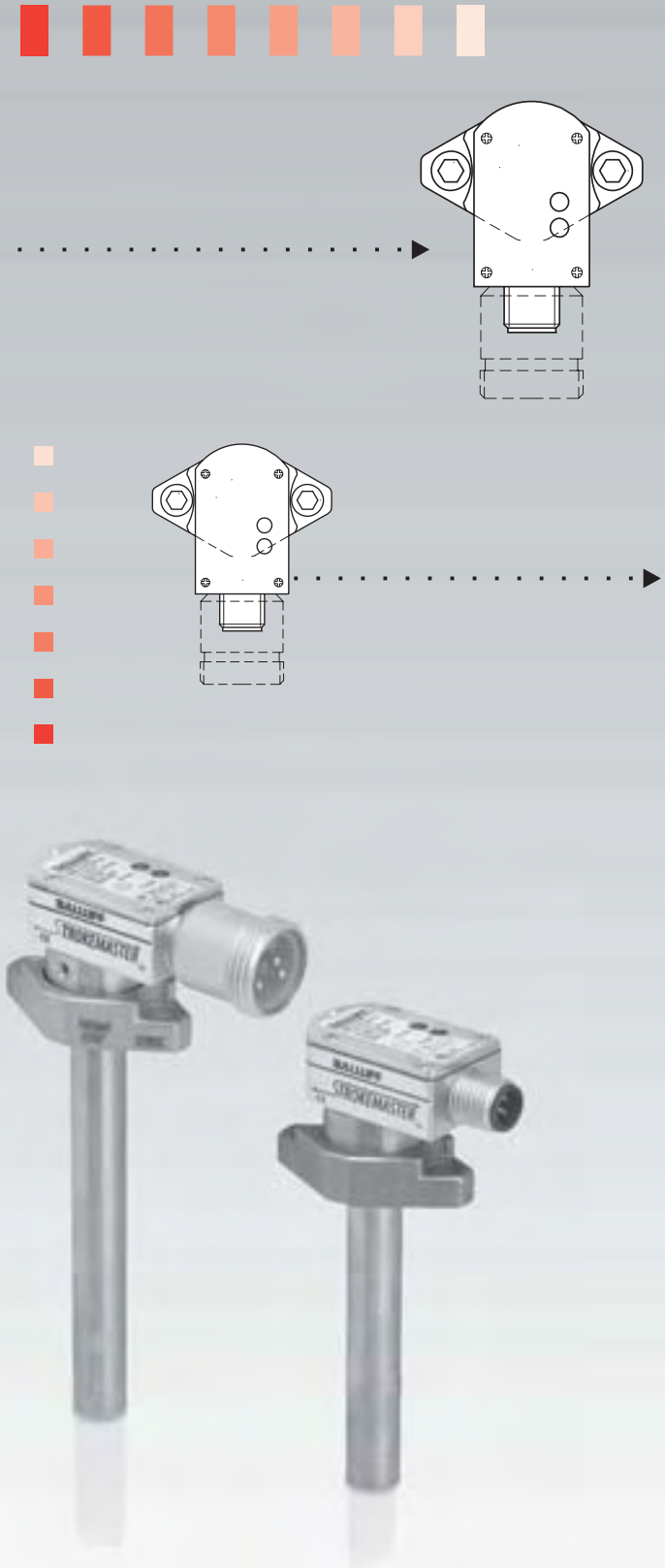
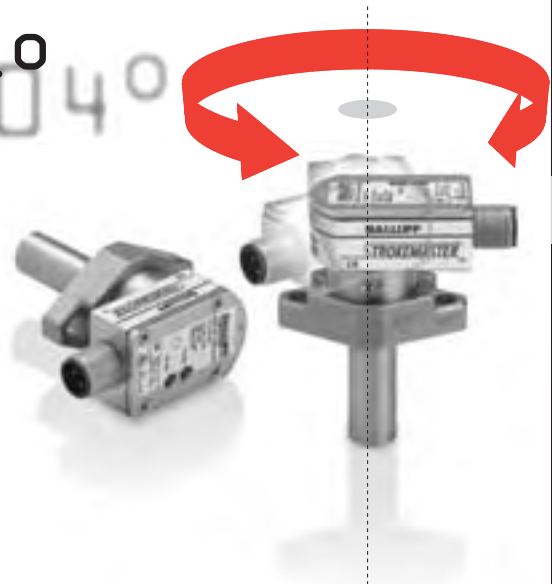
Balluff's Strokemaster® cylinder-position sensors provide precision end-of-stroke sensing for hydraulic cylinders. The sensor body allows 304° of rotation to eliminate the hassle of post-installation cable management, which in some competitive designs requires unbolting the flange and breaking the hydraulic seal.

A high-pressure, inductive proximity sensor, the Strokemaster provides a 2mm (0.08") sensing range to detect the "spud" of hydraulic/pneumatic cylinders and indicate fully retracted or extended position. It mounts with two socket-head cap screws and seals with a Viton O-ring. Withstanding cylinder pressures up to 3000 PSI (207 bar), the embeddable design keeps most of the switch protected within the cylinder, with only a 0.62" (16 mm) high housing exposed outside.

Strokemaster sensors are available in 3-wire DC and 2-wire AC/DC versions, both with mini or micro connectors. Switching frequency is 50 Hz for the AC/DC versions. All units are weld-field immune, short-circuit, and reverse-polarity protected. They fit all popular cylinder designs, with standard available probe lengths of 0.912" - 4.560" (23.165mm - 115.8mm). Custom probe lengths can be achieved by using factory spacer kits. Probes are made of stainless steel with a high-strength ceramic face. Both DC and AC/DC sensors have all-metal housings. The Strokemaster sensor is CE-certified, and its housing is sealed to IP67 requirements.

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304°



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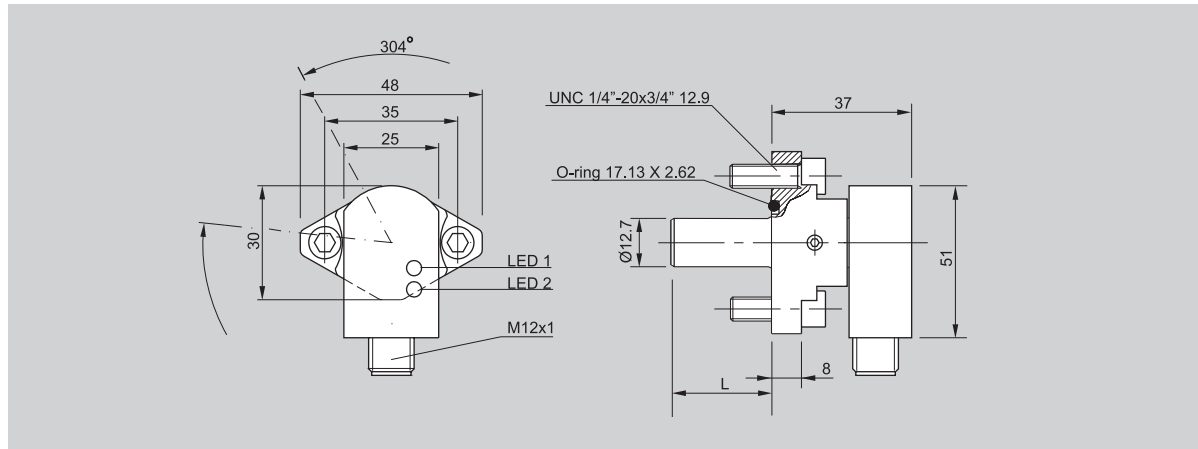
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Mounting	Flush
Rated operating distance s <sub>n</sub>	<b>2 mm</b>
Assured operating distance s <sub>a</sub>	0...1.6 mm



PNP	Normally-open ①	BES 516-300-S 295/0.912"...4.560"-S4
Rated operational voltage U <sub>e</sub>		24 Vdc
Supply voltage U <sub>B</sub>		10...30 Vdc
Voltage drop U <sub>d</sub> at I <sub>o</sub>		≤ 2.5 V
Rated insulation voltage U <sub>i</sub>		75 Vdc
Rated operational current I <sub>o</sub>		200 mA
No-load supply current I <sub>o</sub> damped/undamped		≤ 18 mA/≤ 10 mA
Off-state current I <sub>r</sub>		≤ 80 µA
Protected against polarity reversal		yes
Short circuit/overload protected		yes/yes
Load capacitance		≤ 1.0 µF
Repeat accuracy R		≤ 5 %
Ambient temperature range T <sub>a</sub>		-25...+70 °C
Operating frequency f		10 Hz
Utilization categories		DC 13
Function/Operating voltage indication		yes/yes
Degree of protection per IEC 60529		IP 67
Housing material		stainless steel/aluminum
Material of sensing face		ceramic
Connection		micro connector
Approvals		cULus
High pressure rated up to		<b>207 bar (3000 psi)</b>
Standard lengths (L)		see table on page 5.44
Recommended connector		C04 AEL-00-VY-050M



Bolt sensor to cylinder.



Position cable to desired orientation (even over mounting bolts).

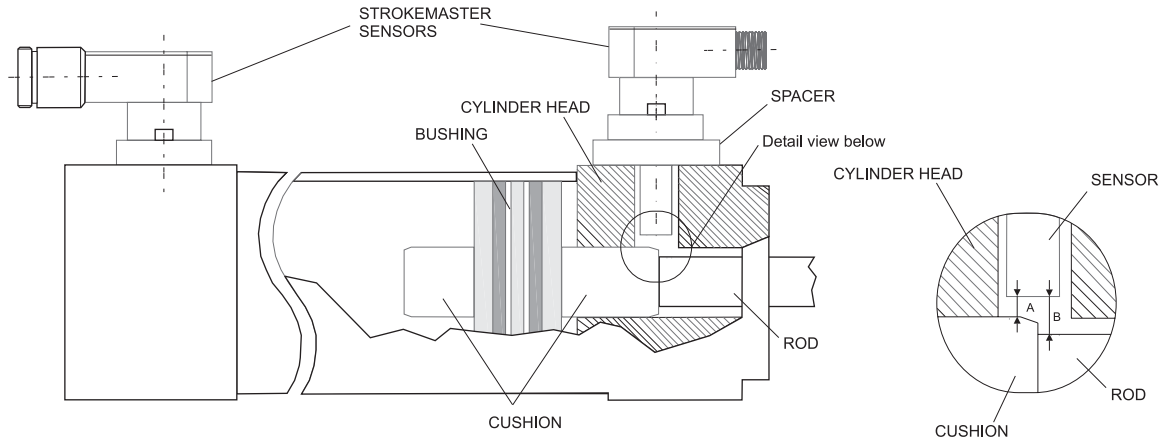


Lock chosen position with one or both of the two integral set screws.

*Note: Some DC units are also available with S5 Mini connector.  
Consult factory for sensor and cable part numbers.*



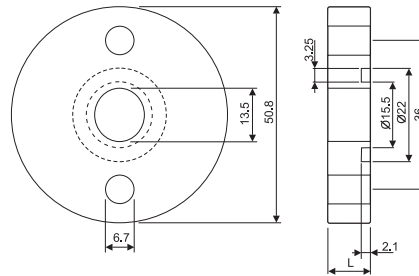
**Strokemaster® Installation**



Note: Spacer may be required to elevate cylinder sensor to position sensing face in optimal position. Balluff recommends the following guidelines when mounting our Strokemaster® sensors:

- A - Recommended to allow for mechanical wear (0.025" to 0.047")
- B - This dimension must be large enough to allow the sensor to turn off when the rod is present (0.110" to 0.118")

**Strokemaster® Spacers**



Below is a table to help you pick out a spacer for custom lengths needed with Strokemaster® sensors:

Probe length (inches)	Z/Spacers (inches)												
	0.180	0.188	0.225	0.307	0.372	0.375	0.500	0.562	0.600	0.684	0.712	0.810	0.937
<b>0.912</b>	0.732	0.724	0.687	0.605	0.540	0.537	0.412	0.350	0.312	0.228	0.200	0.102	—
<b>1.025</b>	0.845	0.837	0.800	0.718	0.653	0.650	0.525	0.463	0.425	0.341	0.313	0.215	0.088
<b>1.25</b>	1.07	1.062	1.025	0.943	0.878	0.875	0.750	0.688	0.650	0.566	0.538	0.440	0.313
<b>1.35</b>	1.17	1.162	1.125	1.043	0.978	0.975	0.850	0.788	0.750	0.666	0.638	0.540	0.413
<b>1.5</b>	1.32	1.312	1.275	1.193	1.128	1.125	1.000	0.938	0.900	0.816	0.788	0.690	0.563
<b>1.75</b>	1.57	1.562	1.525	1.443	1.378	1.375	1.250	1.188	1.150	1.066	1.038	0.940	0.813
<b>1.875</b>	1.695	1.687	1.650	1.568	1.503	1.500	1.375	1.313	1.275	1.191	1.163	1.065	0.938
<b>2.062</b>	1.882	1.874	1.837	1.755	1.690	1.687	1.562	1.500	1.462	1.378	1.350	1.252	1.125
<b>2.375</b>	2.195	2.187	2.150	2.068	2.003	2.000	1.875	1.813	1.775	1.691	1.663	1.565	1.438
<b>2.775</b>	2.595	2.587	2.550	2.468	2.403	2.400	2.275	2.213	2.175	2.091	2.063	1.965	1.838
<b>2.875</b>	2.695	2.687	2.650	2.568	2.503	2.500	2.375	2.313	2.275	2.191	2.163	2.065	1.938
<b>3.775</b>	3.595	3.587	3.550	3.468	3.403	3.400	3.275	3.213	3.175	3.091	3.063	2.965	2.838
<b>4.56</b>	4.38	4.372	4.335	4.253	4.188	4.185	4.060	3.998	3.960	3.876	3.848	3.750	3.623

Example: Need probe length of 1.125" combine sensor BES-516-200-S2-1.35-S21 with a 0.225" spacer.  
(1.35" tube length - 0.225" spacer = 1.125" adjusted length)

Note: A difference of 0.005" will still have to be carefully considered when sizing a spacer and sensor to the cylinder.

- Spacer kits include a spacer, "O" ring, and appropriate mounting screws.
- Other spacer kits may be available: consult factory.

**To order a spacer kit:**

Use part number BESA-516-200-KIT-\* (X.XXX) \*measured in inches  
(For both DC and AC/DC devices - there is no difference in flange dimensions)