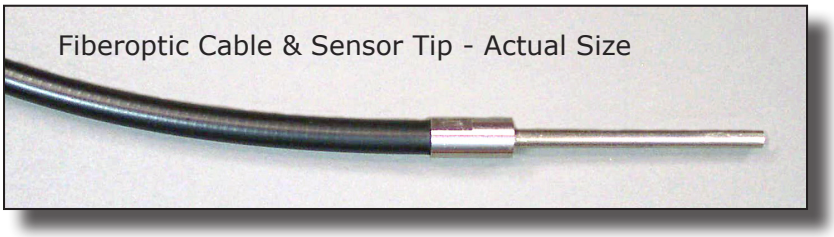
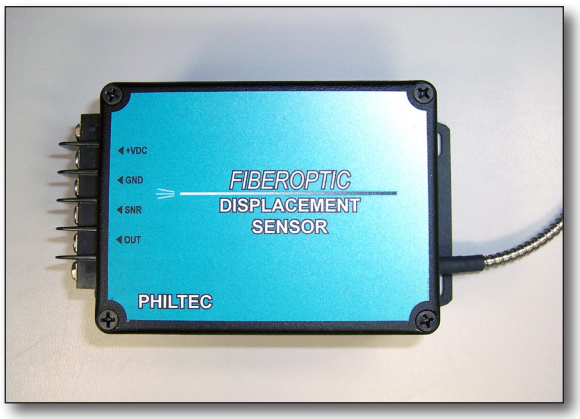
Fiberoptic Sensor - Reflectance Compensated*

Model RC125

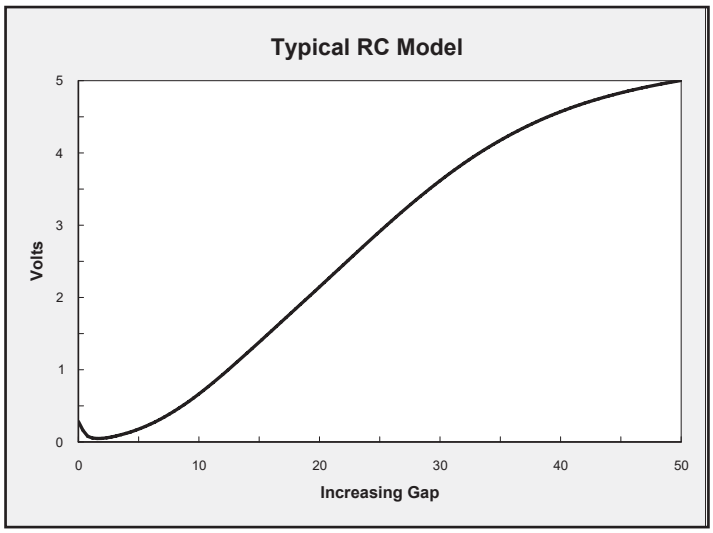


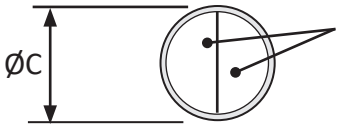


For The Measurement of Distance, Displacement and Vibration
for Targets > Ø 3.2 mm

Features

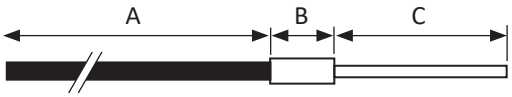
- Reflectance Compensated Output
- Ø 3.2 mm Spot Size
- 9 mm Operating Range
- 0.8 mv/µm Sensitivity (22 mv/mil)





Side-by-Side Fiberoptics
In Sensor Tip

Tip & Cable Dimensions



FEATURE	mm	inch
Tip Outer Diameter, Ø C	3.96	0.156
Fiberoptic Diameter	3.18	0.125
Tip Length, C	38.1	1.5
Collar Length, B	12.7	0.5
Collar Diameter, Ø B	7.11	0.28
Cable Length, A	914	36
Cable Diameter, Ø A	5.9	0.232
Cable Min. Bend Radius	25	1

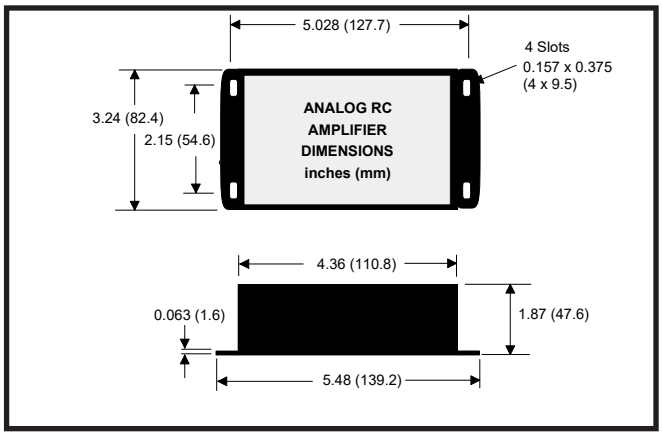
REFLECTANCE COMPENSATION

These are reflective type transducers based upon detecting the intensity of reflected light. RC Model sensors have a pair of fiberoptic detectors in the sensor tip. Light reflected off a target follows two separate paths back to the electronics where a ratiometric calculation provides the distance measurement which is independent of varying surface reflectance; i.e., ***reflectance compensated***.

Analog sensors are fast responding units ideal for process control and vibration measurements in dynamic applications:

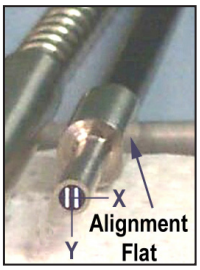
- DC-20 KHz bandwidth is standard
- DC-200 KHz or higher (up to 350 KHz) is optional
- DC-100 Hz providing best resolution, is optional

Standard single channel units include amplifier and sensor tip with 914 mm long (3 foot) fiberoptic cable, require +12 VDC input power, and provide 0 to +5 volt analog output with DC - 20 KHz bandwidth.



SENSOR TIP ALIGNMENT

RC sensors have adjacent fiber bundles in the face of the sensor. An alignment flat is provided on the casing to aid with alignment. The flat is ground parallel to the split between the adjacent fiberoptic bundles, and located on the light transmitting side.



Standard Specifications - RC125						
Electronics		**Fiberoptics**		**Analog Output (0-5 Volts)**		
Light Source	LED, 850 nm	**Light Beam Spread**	**30°**	**Total Range**	0.350 in.	9 mm
Input Voltage	+12 VDC	**Tip Material**	300 Series SS	**Linear Range***	0.060 in.	1.5 mm
Input Current	125 ma max	**Tip Epoxy Outgas**	0.3% @ 200°C 2.4% @ 300°C	**Nominal Standoff***	0.160 in.	4 mm
Bandwidth	DC-20 KHz 3 db down	**Tip Operating Pressure**	15 bar	**Nominal Sensitivity***	31 mv/mil	0.8 mv/µm
Iso-thermal Drift	0.5%	**Tip Operating Temperature**	-55 to 200°C continuous; to 300°C intermittent 1-2 hours	**Resolution**** **DC - 200 KHz** **DC - 20 KHz** **DC - 100 Hz**	 320 µin 160 µin 25 µin	 8 µm 4 µm 0.6 µm
Operating Temperature	**0 to 70°C**	**Cable Jacket** PVC over Steel Monocoil	**10 to 107°C**			
Weight	**0.7 kg -1.5 lbs.**					

NOTE: *Nominal Standoff = the gap distance that places the sensor at the middle of the linear operating range.*

*Standard Specifications provide nominal values only. Actual production values may vary by as much as ±15%.

**These specifications represent best case performance where:
the target is flat, smooth and highly reflective,
the sensor is perpendicular to the target,
the sensor is gapped to its range of highest sensitivity,
fiberoptic cable lengths are standard and the cable is not connectorized.

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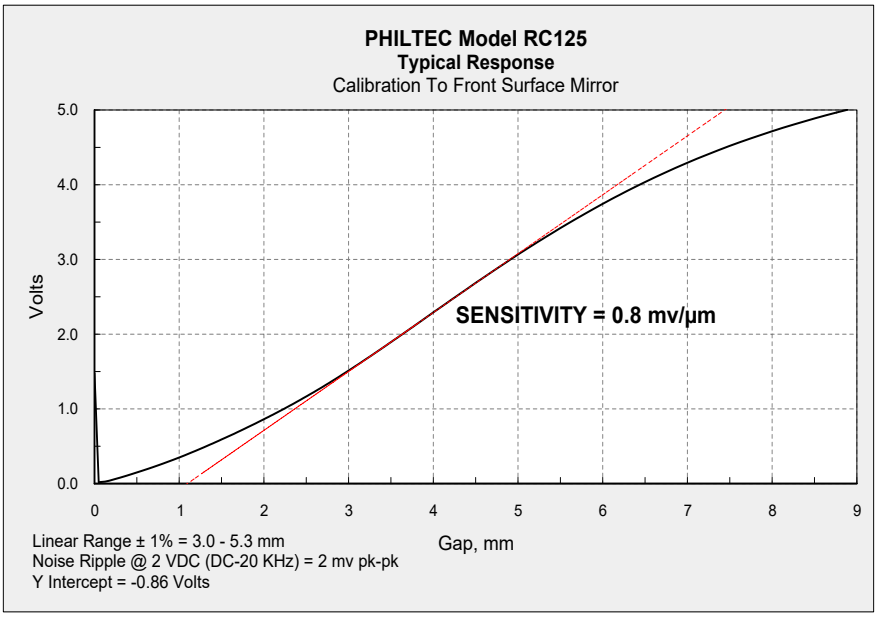
CONVERTING THE ANALOG OUTPUT TO DISTANCE

A calibration chart is provided with each sensor giving the voltage output response to distance. There are three ways to derive accurate distance measurements:

a) within the bounds of the linear range, convert the change in voltage output as follows:
Distance = Δ milliVolts ÷ Sensitivity = µm

b) over the non-linear range, create a lookup table using the XY calibration data points, or

c) use a polynomial curve fit to accurately map the sensor's output function



FACTORY CALIBRATION

A factory supplied calibration chart provides:

- Sensor model & serial number
- Date of calibration
- The linear sensing range
- The slope sensitivity
- The y intercept of the linear range
- The AC noise ripple

The XY calibration data points are made available upon request.

Note: *The RC140 response has a 'dead band' from 0-3 mm due to the gap between fiber bundles in the sensor tip.*

FREQUENCY RESPONSE

The standard 20 KHz RC sensor has a 2-pole butterworth frequency rolloff. The chart here shows that typical response. With the 3 db down point set at 20 KHz, the output is flat out to approximately 6 KHz.

With a high frequency amplifier, the 3 db down point is set at 200 KHz or higher (up to 350 Hz).

With a low frequency amplifier, the 3 db down point is set at 100 Hz.