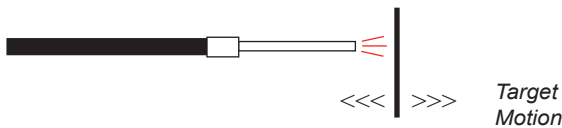


D Type Sensors - Reflectance Dependent

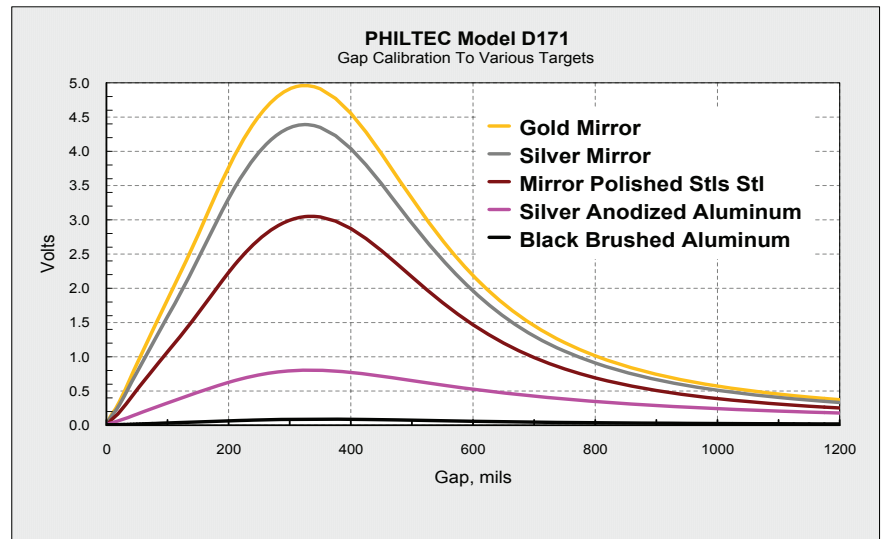
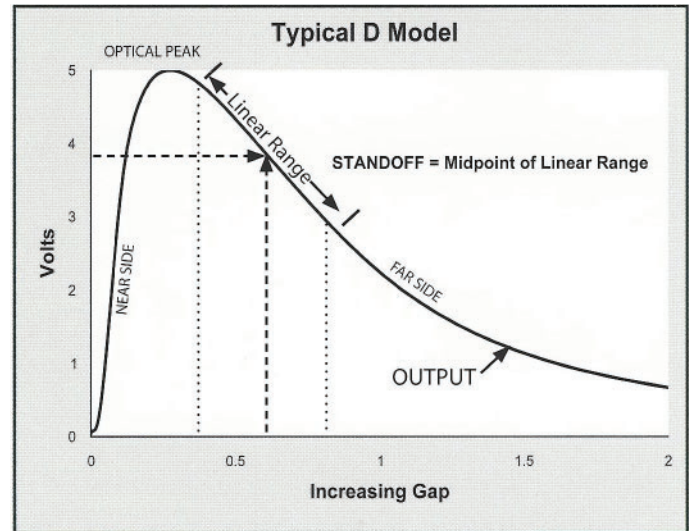
D type sensors provide an output proportional to distance and reflectance of the target. The output function is double-valued: Near Side operation gives highest resolution; Far Side operation gives moderate sensitivity with larger operating range.

D Type Sensors are recommended when the target moves along the axis of the sensor; i.e., single axis vibration where the target reflectivity is constant.



The sensor output can vary greatly with different materials.

TARGET	% REFLECTANCE
Gold Mirror	100
Mirror Polished Aluminum	85 - 90
Mirror Polished Stls Steel	60 - 70
Brushed Aluminum	40 - 50
Copper Clad PC Board	45
Matte Finish Aluminum	30 - 35
Anodized Aluminum	20 - 25
Silver Paint, Glossy	15 - 20
Inkjet Paper, Bright White	8
Fiberglass, Glossy	7
Black Plastic, Glossy	6
Black Matte Finish	3
Flat Black Rubber	1



HOW TO USE THE SENSOR

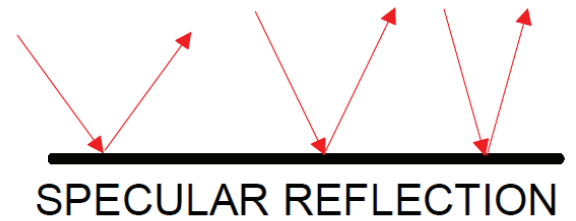
A simple in situ calibration is required to scale the sensor's output for the target's reflectance.

Using the sensor Gain Controls, adjust the peak output to 5 volts to match the output scaling that is provided with the factory calibration chart.

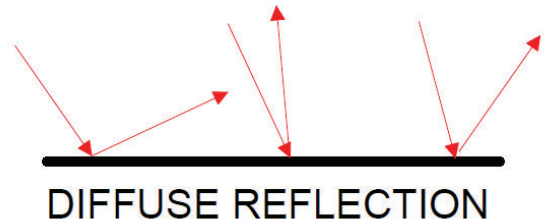


REFLECTIVE NATURE OF THE TARGET SURFACE

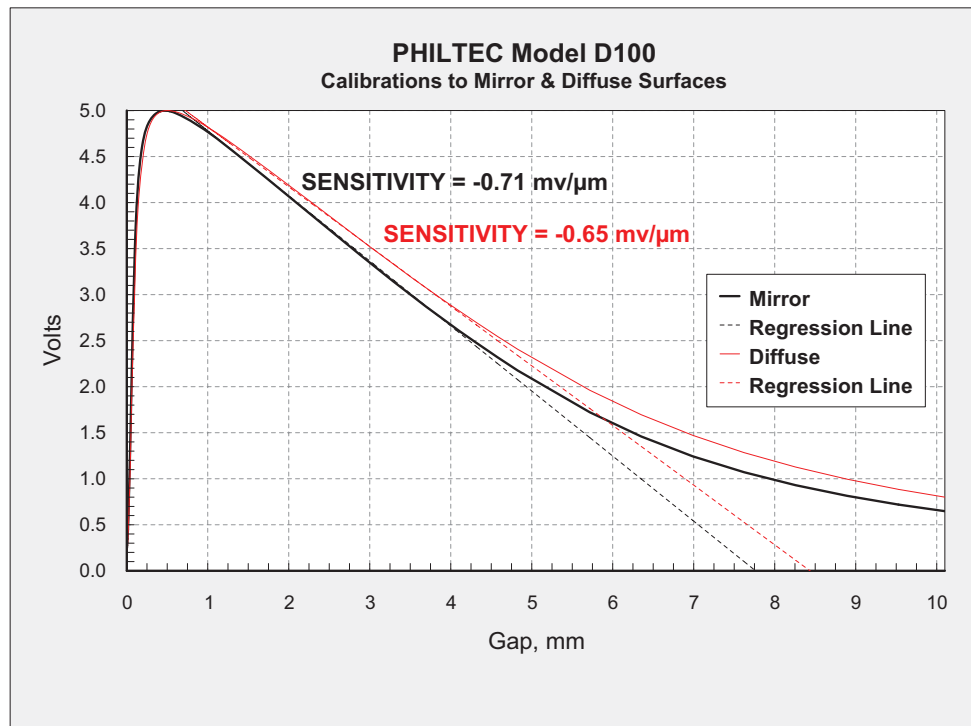
Specular Targets... A mirror surface calibration should be used when making measurements to very smooth, highly polished, mirrored, glossy or very shiny; i.e., specular target surfaces.



Diffuse Targets... A diffuse surface calibration should be used when making measurements to diffuse surfaces. A diffuse surface looks dull rather than shiny.

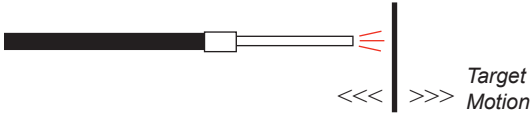


Factory Calibrations... With diffuse surfaces, reflected light rays travel randomly varying path lengths back into the sensor tip, and the sensitivities are 5-10% different than the mirror surface responses. The 5 volt peak setting does not correct for this random scattering of light rays. Therefore, calibrations to both types of targets surfaces are provided....The XY calibration data points are made available upon request.



APPLICATIONS FOR D TYPE SENSORS

Recommended for applications where the target moves parallel to the axis of the sensor...



Single Axis Motion

Applications for Philtec's D models are usually limited to targets having a reciprocating or vibratory motion parallel to the axis of the sensor. With that single-axis motion, the target reflectivity remains constant, and accurate distance measurements can be made.

Actuator Stroke
Bearing Vibration
Diaphragm Deflection
Displacement In Fluids
Impact & Shock Studies

Parts Positioning
Piezoelectric Crystal Vibration
Piston Registration (TDC)
Piston Stroke
Read/Write Head Tracking

Scratch Detection
Servo-Control
Solenoid Travel
Structural Deformation
Surface Finish Evaluation

Tachometry
Turbine Blade Vibration
Ultrasonic Vibration
Vacuum Process Control
Valve Dynamics & Stroke

Speed Sensing Applications (Tachometry)

Standard Machinery

Reflectance Dependent sensors can also be used to measure rotor speeds, turbine blade rate and turbine blade flutter. They generate a fast rising pulse in response to one of two conditions:
a) a sharp change in reflectance (i.e., black to shiny) or
b) the passage of the edge of a part such as a narrow turbine blade.

Micro-Turbomachinery

MEMS Researchers (micro-electromechanical systems) in leading universities use Philtec sensors in their experiments. The smallest models have been popular in this field. These sensors have been provided with bandwidths of 1 MHz and higher.

