



LIST OF CALIBRATION COEFFICIENTS - EXAMPLE

Customer order:	Revision: A	Print date: 29.04.2021
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EQUATIONS

DISPLACEMENT EQUATION

$$l[\mu m]**1 = \alpha \cdot \left(\frac{\lambda_{2,act} - \lambda_{2,ref}}{\lambda_{2,ref}} \cdot k - \frac{\lambda_{1,act} - \lambda_{1,ref}}{\lambda_{1,ref}} \right)^2 + \beta \cdot \left(\frac{\lambda_{2,act} - \lambda_{2,ref}}{\lambda_{2,ref}} \cdot k - \frac{\lambda_{1,act} - \lambda_{1,ref}}{\lambda_{1,ref}} \right) + \gamma - \delta \cdot \left(\frac{\lambda_{2,act} - \lambda_{2,ref}}{\lambda_{2,ref}} \cdot k + \frac{\lambda_{1,act} - \lambda_{1,ref}}{\lambda_{1,ref}} \right)^2 + \varepsilon \cdot \left(\frac{\lambda_{2,act} - \lambda_{2,ref}}{\lambda_{2,ref}} \cdot k + \frac{\lambda_{1,act} - \lambda_{1,ref}}{\lambda_{1,ref}} \right) + \eta$$

String expression:

$$l[\mu m] = \alpha * (((\lambda_{2act}-\lambda_{2ref})/\lambda_{2ref}) * k - ((\lambda_{1act}-\lambda_{1ref})/\lambda_{1ref}))^2 + \beta * (((\lambda_{2act}-\lambda_{2ref})/\lambda_{2ref}) * k - ((\lambda_{1act}-\lambda_{1ref})/\lambda_{1ref})) + \gamma - \delta * (((\lambda_{2act}-\lambda_{2ref})/\lambda_{2ref}) * k + ((\lambda_{1act}-\lambda_{1ref})/\lambda_{1ref}))^2 + \varepsilon * (((\lambda_{2act}-\lambda_{2ref})/\lambda_{2ref}) * k + ((\lambda_{1act}-\lambda_{1ref})/\lambda_{1ref})) + \eta$$

The sensor measures the change in displacement and therefore we recommend „reference“ it after installation using the software in-built option.
 **1 The sensor is designed to return the absolute change from a reference point and therefore we recommend referencing the l[μm] at the beginning of the measurement.

Measurand	Description
α [μm]	Displacement sensitivity
β [μm]	Displacement sensitivity
γ [μm]	Displacement sensitivity
δ [μm]	Displacement sensitivity
ε [μm]	Displacement sensitivity
η [μm]	Displacement sensitivity
k [n/a]	Displacement sensitivity
λ _{1,ref} [nm]	Reference lower FBG
λ _{2,ref} [nm]	Reference higher FBG
λ _{1,actual} [nm]	Actual lower FBG wavelength
λ _{2,actual} [nm]	Actual higher FBG wavelength

CALIBRATION COEFFICIENTS

Nr.	Serial number	Customer code	Product	DISPLACEMENT COEFFICIENTS										
				α [μm]	β [μm]	γ [μm]	δ [μm]	ε [μm]	η [μm]	κ [n/a]	λ _{1,ref} [nm]	λ _{2,ref} [nm]		
1	203729/0001		D-04; Range: 100mm, WL: 1550 / 1552nm, LCP-03: 2x1m, 2x FC/APC, 2x WCP-01	7,0395E+06	-2,1586E+07	-1,3396E+01	-1,4806E+07	-1,9831E+05	5,9881E+01	1,0667E+00	1552,96579	1558,10612		