



LIST OF CALIBRATION COEFFICIENTS - EXAMPLE

Customer order: Revision: A Print date: 29.03.2021
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EQUATIONS

STRAIN EQUATION

$$\Delta\varepsilon = \frac{\Delta\lambda - B \cdot \Delta T}{A}$$

$$\Delta\lambda = \frac{\lambda_{act} - \lambda_0}{\lambda_0} \quad \Delta T = (T_{act} - T_0)$$

STRING EXPRESSION

$$\Delta\varepsilon = ((\Delta\lambda - B \cdot \Delta T) / A)$$

$$\Delta\lambda = ((\lambda_{act} - \lambda_0) / \lambda_0)$$

$$\Delta T = (T_{act} - T_0)$$

For the determination of the strain sensitivity the free fiber length was used as a basis

Measurand	Description
$\Delta\varepsilon$ [με]	Strain shift
$\lambda_{0,inst,strain}$ [nm] **1	Initial strain wavelength
$T_{0,inst}$ [°C] **1	Initial temperature
T_{act} [°C] **2	Actual temperature
$\lambda_{act,strain}$ [nm] **2	Actual strain wavelength

TEMPERATURE EQUATION

$$T = T_{S1} \left(\frac{\lambda_{T,act} - \lambda_{T,ref}}{\lambda_{T,ref}} \right)^2 + T_{S2} \left(\frac{\lambda_{T,act} - \lambda_{T,ref}}{\lambda_{T,ref}} \right) + T_{S3}$$

Measurand	Description
T [°C]	Temperature
$\lambda_{T,act}$ [nm] **1	Actual temp. wavelength
$\lambda_{T,ref}$ [nm]	Reference temp. wavelength
T_{S1} [°C]	Temperature sensitivity 1
T_{S2} [°C]	Temperature sensitivity 2
T_{S3} [°C]	Temperature sensitivity 3

STRING EXPRESSION

$$T = Ts1 * ((\lambda_{T,act} - \lambda_{T,ref}) / \lambda_{T,ref})^2 + Ts2 * ((\lambda_{T,act} - \lambda_{T,ref}) / \lambda_{T,ref}) + Ts3$$

**1 To be measured after installation of the

**2 Measured value during monitoring of the sensor

CALIBRATION COEFFICIENTS

Nr.	Serial number	Customer code	Product	STRAIN COEFFICIENTS		TEMPERATURE COEFFICIENTS			
				A [με ⁻¹]	B [°C ⁻¹]	T _{S1} [°C]	T _{S2} [°C]	T _{S3} [°C]	$\lambda_{T,ref}$ [nm]
1	193075/0001		SWA-00/T; WL: 1538,5/1539,9nm, LCP-03:1x1,1mtr, 1x2,9mtr, 2x FC/APC	7,75842E-07	5,89292E-06	-1,54538E+06	5,33782E+04	2,25017E+01	1538,31052