

ex FIBER OPTICS

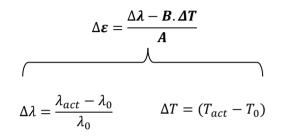
LIST OF CALIBRATION COEFFICIENTS - EXAMPLE

Customer order: Revision: **Print date:** 30.03.2021

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EQUATIONS

STRAIN EQUATION



Measurand	Description
Δε [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
L _{FFL} [m]	Free fiber length

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

 $\Delta \varepsilon = ((\Delta \lambda - B * \Delta T) / A)$ $\Delta \lambda = ((\lambda act - \lambda 0) / \lambda 0)$ $\Delta T = (T \text{ act - } T0)$

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

**1 To be measured after installation of the sensor

**2 Measured value during monitoring of the sensor

STRING EXPRESSION

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

CALIDDATION COFFEIGIENTS

Ar. Serial number code Product A [με¹¹] B [°C¹] L _{FFL} [m] T _{S1} [°C] T _{S2} [°C] T _{S2} 1 194716/0001 SWS-02; WL: 1548,9/1549,9nm, LCP-03: 2x 1mtr; 2x FC/APC, 2x WCP-01 7,77351E-07 5,89292E-06 0,032 -1,89801E+06 5,30998E+04 2,250	°C] λ _{T,ref} [nn
1 194716/0001 SWS-02; WL: 1548,9/1549,9nm, LCP-03: 2x 1mtr; 2x FC/APC, 2x WCP-01 7,77351E-07 5,89292E-06 0,032 -1,89801E+06 5,30998E+04 2,250	1,101
	E+01 1548,6916