sylex® FIBER OPTICS

LIST OF CALIBRATION COEFFICIENTS

Customer order:	N/A	Revision:	A	Print date:	17.04.2025
Quality supervisor:	tsalat@sylex.sk	Production supervisor:	fsvolik@sylex.sk		

EQUATIONS

STRAIN EQUATION

$$\Delta\varepsilon = \frac{\dfrac{\lambda_{act,strain} - \lambda_{0,inst,strain}}{\lambda_{0,inst,strain}} - B.(T_{act} - T_{0,inst})}{A}$$

Measurand	Description	String
$\Delta\varepsilon$ [µε]	Strain shift	Δε
$\lambda_{0,inst,strain}$ [nm] **1	Initial strain wavelength	λ0,inst,strai
$T_{0,inst}$ [°C] **1	Initial temperature	T0,inst
T_{act} [°C] **2	Actual temperature	Tact
$\lambda_{act,strain}$ [nm] **2	Actual strain	λact,strain

STRING EXPRESSION

(((λact,strain-λ0,inst,strain)/(λ0,inst,strain))-(B*(Tact-T0,inst)))/(A)

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	String
T [°C]	Temperature	T
$\lambda_{T,act}$ [nm] **2	Actual temp. wavelength	λT,act
$\lambda_{T,ref}$ [nm]	Reference temp. wavelength	λT,ref
T_{S1} [°C]	Temperature sensitivity 1	Ts1
T_{S2} [°C]	Temperature sensitivity 2	Ts2
T_{S3} [°C]	Temperature sensitivity 3	Ts3

STRING EXPRESSION

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

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

General note: If your product contains WCP-01, make sure all parts are tightened securely.

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]
		FBG1		-	-	-1,54538E+06	5,33782E+04	2,25017E+01	1538,31052
1	193075/0001	FBG2	SSR-01;1xTemp - 3xStrain; WL: 1538,5-48-58-68nm; LI: 1m; LO: 1m; 2x FC/APC	7,75842E-07	5,89292E-06	-	-	-	-
		FBG3		7,75842E-07	5,89292E-06	-	-	-	-
		FBG4		7,75842E-07	5,89292E-06	-	-	-	-

The sensor is compliant with IEC 61757-1-1:2020, IEC 61757-2-1:2021 and IEC 61757:2018
Sensor is manufactured according to ISO 9001:2015 and ISO 14001:2015

Page 1 of 1