# FP - PI Industrial Pressure Sensor

The FP-PI is a type of fiber optic pressure sensor based on the Fabry-Perot interference principle, which has the advantages as below: immune to EI/RFI, small size, reliable measurement in harsh environments, high precision and corrosion resistance. It is mainly used in places where high temperatures and high pressure may occur (oil and defense industry) and in harsh and dangerous environments.

# Features:

- I Intrinsically safe
- I Immune to electromagnetic interference
- I Can work long-term under 200°C/300°C
- I Pressure measurement up to 100Mpa

# Applications:

- I Aviation / Defense / Metallurgy
- I Oil wells/ Natural Gas / Pumping Stations
- I Plastic Injection Molding & Extrusion Monitoring



### Parameters

Resolution	0.01%FS
Pressure measuring range	0~100MPa (Customized)
Precision	1%FS
Overload pressure	150%FS
Operation temperature	200°C with long term
Fiber optic connector	FC/APC
Sensor packaging	Bare chip&Metal packaging

# Ordering Info



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# **FP - PM Medical Pressure Sensor**

The FP-PM medical pressure sensor is an embodiment of all the benefits of fiber optics and MEMS technology, designed specifically for medical and research use. It has the characteristics of small size, high precision, good stability, immune to electromagnetic interference, corrosion resistance, and can be used for reliable measurement in harsh environment. It is especially suitable for measuring or monitoring the pressure at specific positions in human or animal body in clinical application, animal experiments and scientific research. Because of its small size, it can easily enter the narrow cavity or integrate with other instruments.

# Features:

- I Intrinsically safe
- I Immune to EMI/RFI/MRI
- I Pressure measuring range up to 300kPa

#### Applications:

- I Human and animal physiological pressure measurement
- I Online industrial process monitoring
- I Micro space pressure detection



#### Parameters

Resolution	0.01%FS
Pressure measuring range	0~300kPa
Precision	1%FS
Overload pressure	300%FS
Operation temperature	200°C with long term
Fiber optic connector	FC/APC
Sensor diameter	> 250µm
Sensor packaging	Bare chip&Metal packaging/PI tube
PI diameter	> 330µm



# **FBG-S Micro Strain Sensor**

The FBG-S micro strain sensor is based on fiber grating sensing technology and use unique elastomer design. The FBG is fixed on the stainless steel base or flexible base in a pre-tensioned state. The FBG-S micro strain sensor uses glueless packaging technology to ensure long-term reliability of the sensor.

### Features:

- I Metal or non-metal packaging can be provided
- I The same strict quality standards as traditional electrical sensors
- I Integrated package to protect pigtails and eliminate residual stress
- I Quick, easy to install and reusable
- I Fiber output at both ends, multiple sensors can be connected in series on one fiber
- I Sensor mounting and protection process is

the same as traditional strain gauges

Applications:

- I Long-term Security monitoring of buildings, bridges, dams, tunnels
- I Long-term Security monitoring of ships, spacecraft, trains and other complex structures
- I Structural surface strain measurement
- Experimental mechanics assessment requiring multi-point sensor



#### Parameters

Number of gratings	1 (Serial connection)
Strain sensitivity	1.2pm/με
Range of working temperature	-40~300°C
Measuring strain range	±3000/1500με
Component material	Stainless steel /flexible base
Fiber type	SMF28 (PI)
Fiber optic connector	FC/APC
Weight	< 25g
FWHM	< 0.3nm
Side mode suppression ratio	> 12dB
Center wavelength (±0.1nm)	1528~1568nm
Peak reflectance	> 70%



# **FBG-T** Temperature Sensor

The FBG-T thermometer is designed for surface or internal temperature measurement. They can be used for tunnel fire protection, switch cabinet temperature measurement, and embedded temperature measurement.

### Features:

- I Immunity to EMI
- I Good temperature, corrosion and aging resistance
- I High precision, high resolution
- I Integrated package that eliminates the residual stress
- I Easy to use, fast to install, and reusable

# Applications:

- I Temperature monitoring in important and hazardous areas with explosion-proof requirements like petrochemical storage tank
- I Temperature monitoring in high voltage power cable, switch gear
- I Temperature monitoring in tunnel
- I Temperature monitoring of equipment cabins such as train, aircraft and ships



### Parameters

Measuring temperature range	-40°C~300°C
Temperature fitting method	Polynomial fitting
Measurement accuracy	±0.5℃
Component material	Ceramics
Center wavelength(±0.1nm)	1528~1568nm
Peak reflectance	> 70%
FWHM	< 0.3nm
Side mode suppression ratio	> 12dB



# High Sensitivity FBG-T Fiber Grating Temperature Sensor

The fiber grating thermometer is designed for temperature testing of different structural surfaces or internals. It can be used for tunnel fire protection, switch cabinet temperature measurement, embedded temperature measurement, etc. Its installation type includes surface mounting and embedding. It can be buried inside the object to be measured or adhered to the surface of the object to be measured for temperature measurement. It is widely used in large structures and buildings such as bridges, dams, offshore oil platforms, oil and gas pipelines, and electricity, Quasi-distributed and accurate temperature measurement of large facilities or equipment in the fields of military, fire, mining, aerospace and other fields. Using the thermal expansion coefficients of different materials to influence the temperature sensitivity of the grating, we can provide sensors with different sensitivities according to customer requirements.

#### Features

- I High sensitivity
- I Not subject to electromagnetic interference
- I Good temperature resistance, corrosion resistance and aging resistance
- I High precision, high resolution
- I Integrated package eliminates residual stress
- I Easy to use, fast to install, and reusable

#### Applications

I Temperature monitoring in important and hazardous areas with explosion-proof requirements like petrochemical storage tank

- I Temperature monitoring in high voltage power cable, switchgear
- I Temperature monitoring in tunnel
- I Temperature monitoring of equipment cabins such as train, aircraft and ships



# Parameters

Number of gratings	1 (Serial connection)
Measuring temperature range	-20~200°C
Temperature sensitivity	Calibration polynomial coefficient (40-50pm/°C)
Measurement accuracy	±0.1°C
Repeatability	±0.1°C
Dimensions	35mm*10mm*5.5mm
Component material	Ceramic/metal
Center wavelength(±0.1nm)	1528~1568nm
Peak reflectance	> 70%
FWHM	<0.3nm
Side mode suppression ratio	> 12dB
Fiber coating	Polyimide
Fiber optic connector	FC/APC
Pigtail temperature range	-20~200℃
Minimum bending radius of pigtail	> 15mm



# **FBG-HT High-Temperature Sensor**

FBG-HT high temperature sensor uses Regenerated Bragg Gratings (RBGs) as sensing elements, which can be used for temperature measurement of the range from room temperature to 1000 °C. The Regenerated Bragg Grating (RBGs) is obtained by annealing the common I – type UV writing FBG. Its reflectivity is stable, and its reflection wavelength has a good linear relationship with the temperature to be measured.

### Features:

- I Immunity to EMI
- I Good temperature, corrosion and aging resistance
- I High precision, high resolution
- I Integrated package eliminates residual stress



I Easy to use, fast to install, and reusable

### Applications:

- I Temperature monitoring in important and hazardous areas with explosion-proof requirements like petrochemical storage tank
- I Temperature monitoring in high voltage power cable, switchgear
- I Temperature monitoring in tunnel
- I Temperature monitoring of equipment cabins such as train, aircraft and ships

#### Parameters

Measuring temperature range	-40°C~1000°C
Temperature fitting method	Polynomial fitting
Measurement accuracy	±2.0°C
Component material	Ceramic/Stainless steel tube
Temperature sensing length	20mm
Dimensions	Connector:15mm*15mm*15mm
	Tube:Ф3mm*170mm
Fiber optic connector	FC/APC
Central wavelength(±0.1nm)	1528~1568nm
FWHM	< 0.3nm
Side mode suppression ratio	> 12dB



# FBG-A Accelerometer Sensor

FBG-A is a fiber-optic accelerometer based on Fiber Bragg Grating (FBG) technology. The optimized design makes it suitable for acceleration detection of large structures, ranging from 0 to 1 kHz. It can be designed into two-dimensional and three-dimensional combinations by different structures.

# Features:

- I As strict as traditional sensors
- I Not subject to electromagnetic interference
- I Teflon pigtail protection, the sensor is tightly sealed
- I Mounting blocks are available for two or three axis mounting

# Applications:

- Long-term Security monitoring of bridges, dams, buildings, tunnels, ships, spacecraft, trains and other complex structures
- I Structural surface strain measurement
- I Vibration, displacement and acceleration detection under strong magnetic field or in insulation-required conditions.



### Parameters

Strain sensitivity	15/30 pm/g
Measuring frequency	700/1000Hz
Strain range	0~50 g
Range of working temperature	-40~250°C
Dimensions	40*20*3/35*25*30/33*18*3(mm)
Component material	Metal/Ceramic
Fiber optic connector	FC/APC



# **FBG-D Displacement Sensor**

FBG-D fiber Bragg grating displacement sensor uses the inherent displacement sensitivity of the fiber Bragg grating to test displacement changes. The fiber Bragg grating is packaged in a special way, which increases the sensitivity of the sensor to displacement. It can be used to monitor the tension and compression displacement, to compensate the temperature by double grating package, to monitor the construction cracks of buildings, bridges, dams, internal tension joints of concrete, and the temperature change.

# Features

- High precision L
- L High reliability, high stability
- Convenient and fast connection, easy to networking multi-point measurement L
- Customize L

# **Applications**

Monitoring displacement and temperature of buildings, bridges, dams, slopes, etc. 



# Parameters

Wavelength range	1528~1568nm
Displacement range	100mm
Displacement resolution	0.03%FS
Displacement accuracy	1%FS
Temperature resolution	0.04°C
Temperature accuracy	1°C
Temperature range	-20~85°C
Joint type	FC/APC or Customize
Casing O.D.	Ф25-360
Packaging material	Stainless steel
Tail type	Φ3

# FBG-D Displacement Sensor (Temperature compensation type)

The FBG-D02 Displacement Sensor is a temperature compensated displacement sensor with dual fiber gratings and dual fiber connectors. It has the function of simultaneously precise measurement of displacement and temperature to solve the cross-sensitive problem of displacement and temperature during actual measurement. The design of dual fiber connector is convenient for the series networking of multiple fiber Bragg grating sensors. It can be used to respectively monitor tensile and compressive displacement, and can be used to monitor displacement and temperature of buildings, bridges, dams, slopes, etc.

# Features

Immune to EMI/RFI/MRI High resolution, high precision and high reliability Dual fiber connector for the series networking of multiple fiber Bragg grating sensors

#### Applications

I Monitoring displacement and temperature of buildings, bridges, dams, slopes, etc.



### Parameters

Wavelength range	1525-1565nm
Displacement range	100mm
Displacement resolution	0.05%FS
Displacement accuracy	1%FS
Temperature range	-20~85°C
Temperature resolution	0.05%FS
Temperature accuracy	0.5%FS
Tail type	Φ3*1.5mm armored cable
Joint type	3.0 FC/APC
Packaging material	stainless steel
Dimensions	Φ25*360mm

# WLID White Light Interference Demodulator

WLID signal demodulator is based on white light interference (WLI) technology. It is suitable for FP-PM interference fiber optic pressure sensor. It is an integrated instrument that all data is processed internally and the test results are output by the display. The integrated touch panel makes human-computer interaction easy. We can also provide OEM module for various applications.

# Features:

- I High linearity and precision
- I 250Hz sampling rate
- I Customized output options
- I Touch screen control



# Applications:

- I Physiological pressure monitoring
- I Pressure monitoring in animal test
- I Pressure measuring in laboratory
- I Industrial OEM application



#### Parameters

Nun	nber of channels	1
(	Compatibility	FP-PM Medical Pressure Sensor
	Full Scale	5000nm
	Resolution	0.1nm
	Precision	±1.5nm
S	ampling rate	250Hz
	Input power	15W
Stor	age temperature	-40 °C to 70°C
Opera	ating temperature	0℃ to 45 ℃
	Humidity	95%RH Non-condensing



# **TLSD Fiber Bragg Grating Demodulator**

TLSD is a Fiber Bragg Grating demodulator by scanning spectrum. It uses a scanning narrow-band semiconductor laser as light source to perform high-resolution fiber grating demodulation in the range of 40nm. It is designed for static FBG measurement and can be used for real-time online monitoring of temperature, stress, strain and displacement. The PLC splitter is used to cost efficiently expand the channel and to enable the synchronous acquisition. The demodulator has high reliability and temperature stability due to the absence of any moving parts.

# Features:

- I Good repeatability, high demodulation accuracy
- I All semiconductor components, high reliability
- I Good temperature stability

# Applications:

- I Long-term security monitoring of buildings,bridge,minerals,tunnels
- I Pipeline measurement,platform health monitoring
- I Airline
- I Industrial measurement





#### Parameters

Demodulation range	40nm(1528~1568nm)
Number of optical channels	Maximum number of channels 32 (optional 4, 8, 16)
Maximum sensor number of each channel	30
Scan cycle (synchronous acquisition of all channels)	3 Hz
Wavelength repeatability	Typ. ± 1pm
Wavelength accuracy	Typ. ± 2pm
Operating temperature	-15~65 ℃
Dynamic Range	25 dB
Communication Interface	RJ-45 Ethernet
Fiber optic interface	FC/APC
powered by	5 VDC/ 4 A
Power consumption	~ 15 W



# **IFCD High-speed Demodulator**

The IFCD series of high-speed demodulators use the interference fringes counting method to precisely demodulate the length change of the F-P cavity. Its bandwidth can be up to 100MHz. And it can optionally use two laser source with different wavelength at the same time to do the demodulation, which greatly improves the accuracy and reliability. Thanks to the low loss of C-band source transmitting in the fiber, the demodulator can be used for long-distance detection or monitoring. The IFCD series are compatible with FP-PI and FP-PM pressure sensor and used for high-speed pressure monitoring.

Features:

- I Good reliability and high demodulation accuracy
- I 100MHZ sampling rate
- I Used for long-range detection



#### Parameters

#### Applications:

- I Industrial blasting
- I Aerospace
- I Railway pipeline
- I Military industry



Fiber optic connector	FC/APC
powered by	12 VDC
Channel number	1
0	FP-PI Industrial Pressure Sensor
Compatibility	FP-PM Medical Pressure Sensor
Full Scale	10µm
Sampling rate	100MHz
Detection distance	20Km
Storage temperature	-40 ℃~70℃
Operating temperature	0°C~45 ℃
Humidity	95%RH Non-condensing

