

Industry-leading accuracy

# HORIBA high-accuracy temperature measurements

Non-Contact Infrared Thermometer Series



Built-in type  
Non-Contact Infrared Thermometer  
**IT-470F-H**



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# Industry-leading accuracy

## HORIBA's exclusive Infrared-based high-accuracy temperature measurement technologies

HORIBA incorporates unique, home-grown technologies into non-contact infrared handheld thermometers and built-in type.

HORIBA's IT product line offers industry leading accuracy supported by years of know-how in infrared sensor development and a track record of success across many industries.

### Wavelength optimization for high sensitivity

## Infrared Multi-Layer Film Filter

Years of successful development of infrared multi-layer filters are leveraged to identify the best wavelength regions and filter designs matched to sensor performance to ensure high accuracy temperature measurements.



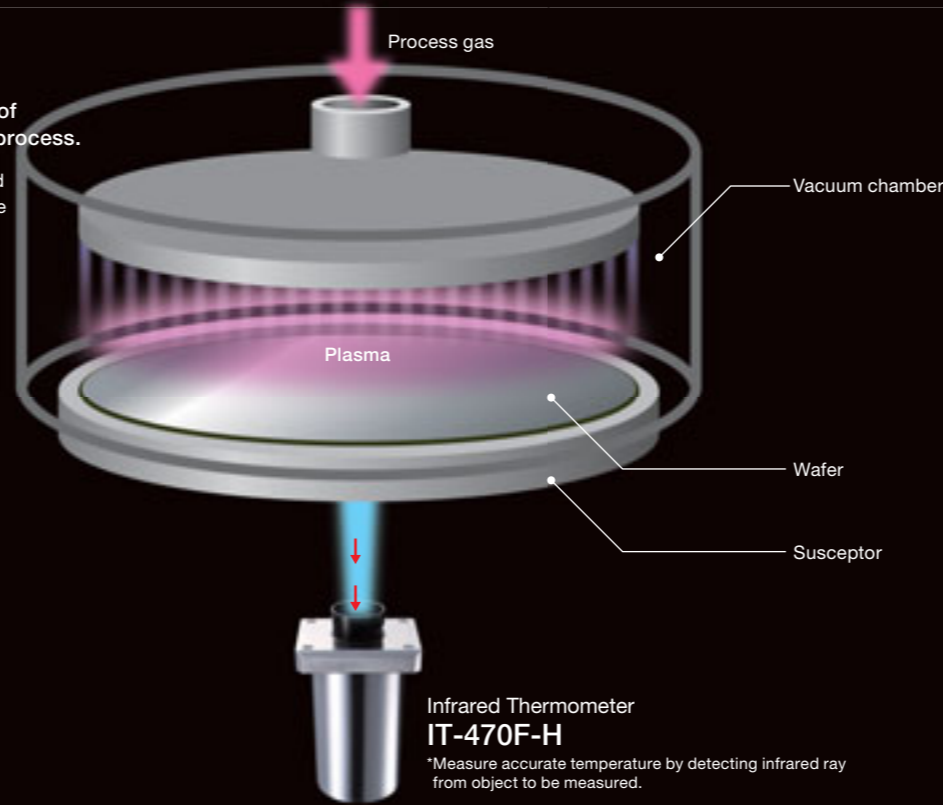
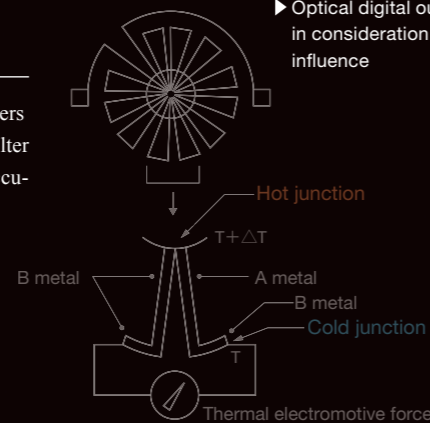
### Unique structure for high stability

## Thermopile Sensor

Adoption of a new sensor structure provides enhanced resistance to fluctuations in ambient temperature for very stable measurement with minimal drift.

Japan Patent number 5658059

Temperature measurement of a susceptor during plasma process.  
▶ Optical digital output is equipped in consideration of extrinsic noise influence

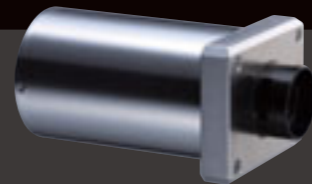


Infrared Thermometer IT-470F-H  
\*Measure accurate temperature by detecting infrared ray from object to be measured.

Built-in type  
Non-Contact Infrared Thermometer  
**IT-470F-H**

Absolute high measurement accuracy ( $\pm 0.4^{\circ}\text{C}$ ) and superior repeatability of ( $\pm 0.2^{\circ}\text{C}^*$ ) temperature measurement should contribute to improve process stabilization.

\*Under given conditions.

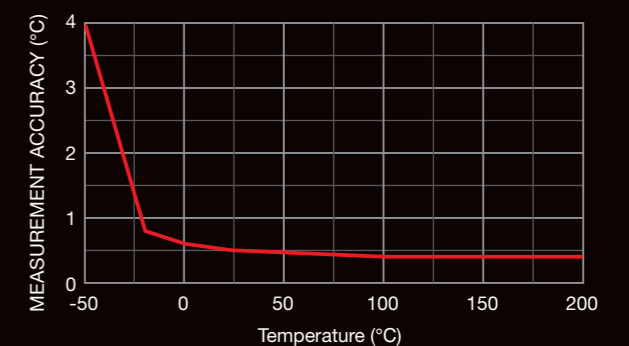


### Unique calibration equipment ensures extreme accuracy

## Stabilized Black Body Furnace

Exclusive in-house black body furnace technology produces superior uniform temperature conditions to deliver industry-leading characterization and calibration.

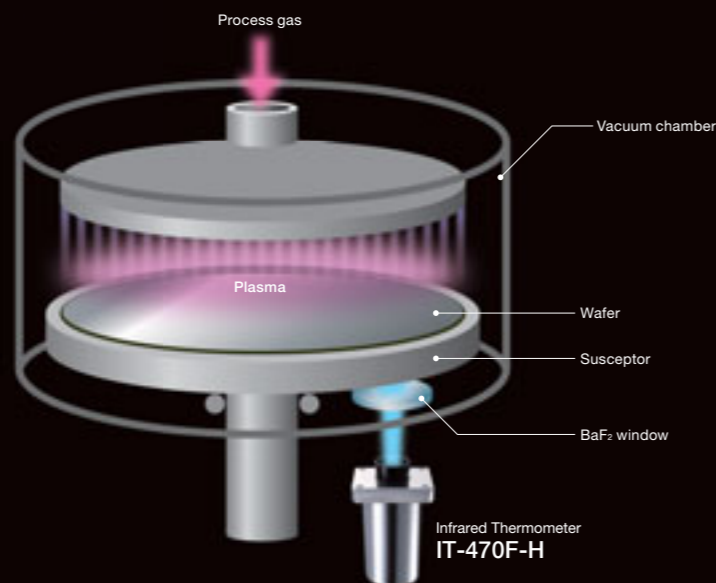
IT-470F-H measurement accuracy



## Adoptable to semiconductor and FPD production which required high accuracy temperature measurement

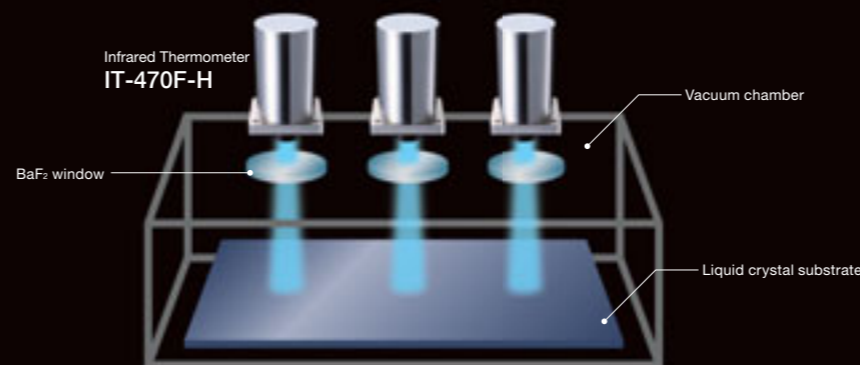
### In case of a susceptor is in a vacuum chamber

▶ Temperature measurement of a susceptor is possible from outside of a chamber through the window



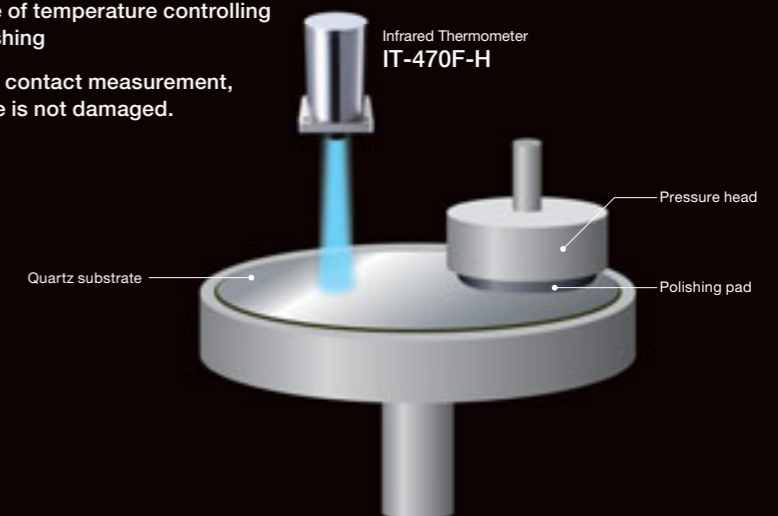
### In case of surface temperature measurement of liquid crystal substrate in FPD production process.

▶ As non contact measurement, surface is not damaged.



### In case of temperature controlling in polishing

▶ As non contact measurement, surface is not damaged.

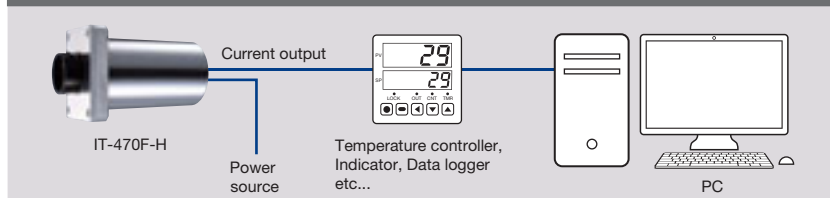


## Specification of IT-470F-H

Measurement wavelength	8 to 14 $\mu$ m
Measurement temp. range	-50 to 200°C
Output resolution	Optical digital output: 0.1°C Current output $\leq$ 0.025%FS
Accuracy* (Optical digital output)	$\pm$ 4.0°C (Object temperature -50°C) $\pm$ 0.8°C (Object temperature -20°C) $\pm$ 0.6°C (Object temperature 0°C) $\pm$ 0.5°C (Object temperature 23°C) $\pm$ 0.4°C (Object temperature 100°C~) (Linear interpolation is applied for the mid-points of object temperature and interpolated data are rounded to one decimal place.)
Repeatability (Optical digital output)	0.7°C (Object temperature -50°C) 0.5°C (Object temperature 23°C) 0.5°C (Object temperature 200°C) (In case of the emissivity = 1.000 and use the 2 $\sigma$ value of 10 times measurement)
Response time (Optical digital output)	Optical digital output: $\leq$ 1.4 sec (running average 1 sec, at 95% response)
Data sampling period	0.1 sec
Display update period	Optical digital output: 0.2 sec Current output: 0.1 sec
Measuring diameter	$\phi$ 8mm/Distance 150mm (incident light amount 90%)
Emissivity setting	0.001 to 1.000 changeable (Setting at factory shipping)
Operating temp. & humidity	0 to 55°C, 35~85%RH (no condensation)
Power	DC24V $\pm$ 5%
Function	Optical digital output (JIS F05) Current output 4 to 20mA (Load resistance 100 $\Omega$ , non-isolated)
Dimensions	55x44x96mm Power, Current cable attached (Standard length 2m)
Mass	$\leq$ 300g

\*Condition: Operating temperature 24 to 29°C (include temperature of attachment), Humidity 55 $\pm$ 20%, Emissivity correction setting 1.000.

## IT-470F-H system setup example



■ For the measurement window of a furnace or vacuum chamber.

[BaF<sub>2</sub> window]  
 $\phi$ 40x4t



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