

Model **FL** series


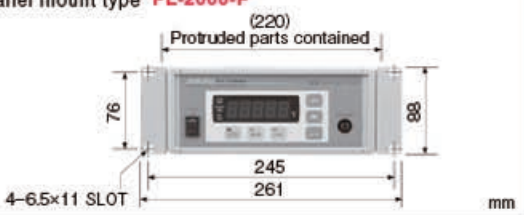

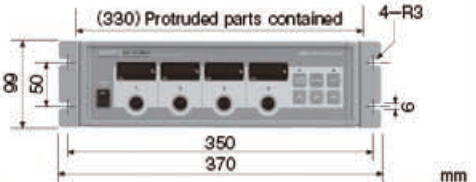
Fiber Optic Thermometer

The products in the FL Series can measure temperatures in environments subject to high-frequency waves, microwaves, or high voltages-areas where electric thermometers such as thermocouples, platinum resistance temperature detectors, and thermistors are typically ineffective.

FL模式系列

荧光式光纤温度计FL模式系列可以测量金属测棒温度计不能测量的高频率、微波及高电压等特殊环境的温度。

蛍光式光ファイバー温度計 FLシリーズは、熱電対やPt、サーミスタなどの電気式温度計では計測困難な高周波・マイクロ波または高電圧などの過酷な環境下において接触式で温度計測が可能です。

<p>1ch. model FL-2000</p> <p>Stand type FL-2000</p> 	<p>Panel mount type FL-2000-P</p> 
<p>4ch. model FL-2400</p> <p>Stand type FL-2400</p> 	<p>Panel mount type FL-2400-P</p> 

Features

- Capable of measurements in environments subject to high-frequency waves or high voltages.
 - A fiber optic thermometer offering a wide measurement range.
 - Analog output capability allows use for machine temperature control.
 - Measurement data can be imported into a PC using software bundled with the thermometer.
- 可在高频率、高电压的环境下测量。
 - 此荧光式光纤温度计可测量广域温度。
 - 信号输出功能可用于设备的温度控制。
 - 附带的PC软件可采集测量数据。

● Operational environment of software (AMS-850)

OS	Microsoft® Windows® 7, Windows® 8.1, Windows® 10 (for English)
Memory	64MB or more (Operational environment of corresponding OS)
HDD	Min. 5MB of free space (Operational environment of corresponding OS)
Monitor	Min. resolution of 800 × 600 pixels

※ All PCs under the recommended environment are not guaranteed to work successfully with AMS-850.

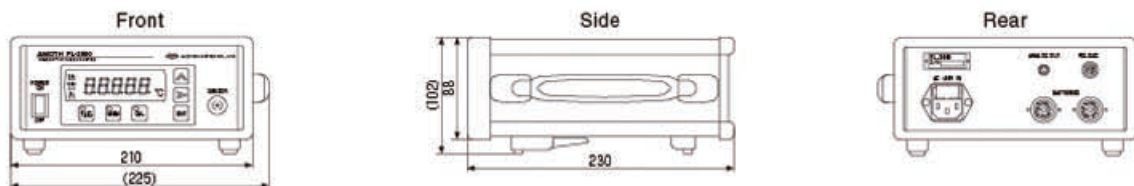
※ AMS-850 can be used only by the user that has a system administrative right (Administrator).

※ AMS-850 does not support Mac OS.

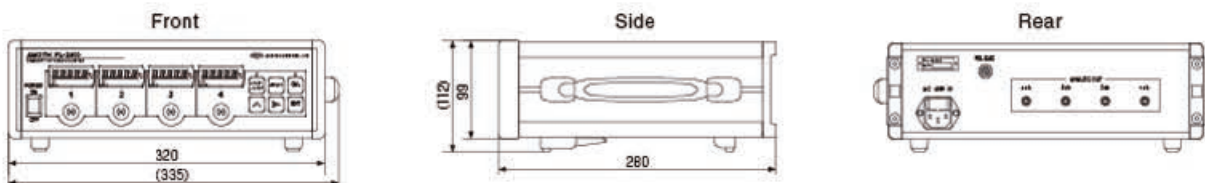
※ Microsoft® Windows® 7, Windows® 8.1, Windows® 10 and Excel® are registered trademarks of Microsoft Corporation in the United States and other countries.

External dimensions

FL-2000



FL-2400



mm

Fiber probes

<p>FS100 - * M General-purpose type temp. range : -190°C ~ 260°C</p> <p>Applications involving microwaves, high magnetic fields, certain food preparation processes, power lines, and electric circuit components</p> <p style="text-align: right;">mm</p>	<p>FS300 - * M Light-resistant type temp. range : -190°C ~ 260°C</p> <p>Measurements performed in laser beam, plasma, or other intense light</p> <p style="text-align: right;">mm</p>																			
<p>FS150 - * M High durability general-purpose type temp. range : -190°C ~ 260°C</p> <p>The durable type which sensing part of FS100 made of the same thickness as the cable</p> <p style="text-align: right;">mm</p>	<p>FS400 - * M High temperature type temp. range : 20°C ~ 400°C</p> <p>Various materials, excluding liquids, in semiconductor manufacturing equipment or microwave heating devices</p> <p style="text-align: right;">mm</p>																			
<p>FS100H - * * - * M Liquid and chemical-resistant type temp. range : -190°C ~ 260°C</p> <p>Oils, liquid or chemicals</p> <p style="text-align: right;">mm</p>	<p>FS500 - * M Needle type temp. range : -60°C ~ 260°C</p> <p>Semisolid substances, e.g., food</p> <p style="text-align: right;">mm</p>																			
<p>FS150H - * * - * M High durability liquid and chemical-resistant type temp. range : -190°C ~ 260°C</p> <p>The durable type which sensing part of FS100H made of the same thickness as the cable</p> <p style="text-align: right;">mm</p>	<p>FS600 - * M Plastic type temp. range : 0°C ~ 80°C</p> <p>Animal tests using hyperthermia equipment or MRI or NMR systems</p> <p style="text-align: right;">mm</p>																			
<p>FS200 - * M Chemical-resistant type temp. range : -30°C ~ 200°C</p> <p>Chemicals</p> <p style="text-align: right;">mm</p>	<p style="color: red; text-align: center;">How to order of Fiber probes</p> <p>It can be chosen the length of cable and Teflon coating to suit the purposes of specific your application.</p> <p style="text-align: center; color: red; font-weight: bold;"> FS100 - * M FS100H - * * - * M ① ② ① </p> <p>Replace the asterisk (*) in the model with selectable number.</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td rowspan="3" style="width: 5%; vertical-align: middle;">①</td> <td style="width: 20%;">Cable length</td> <td style="width: 5%;">2</td> <td style="width: 5%;">2m</td> <td rowspan="3" style="width: 5%; vertical-align: middle;">②</td> <td style="width: 20%;">Teflon coating length</td> <td style="width: 5%;">01</td> <td style="width: 5%;">0.1m</td> </tr> <tr> <td>(Specify a cable length in 1m increments.)</td> <td>3</td> <td>3m</td> <td>(Specify a Teflon coating length in 0.1m increments, MAX.length : 1m)</td> <td>05</td> <td>0.5m</td> </tr> <tr> <td>...</td> <td>...</td> <td>...</td> <td>10</td> <td>1m</td> </tr> </table>	①	Cable length	2	2m	②	Teflon coating length	01	0.1m	(Specify a cable length in 1m increments.)	3	3m	(Specify a Teflon coating length in 0.1m increments, MAX.length : 1m)	05	0.5m	10	1m
①	Cable length		2	2m	②		Teflon coating length	01	0.1m											
	(Specify a cable length in 1m increments.)		3	3m			(Specify a Teflon coating length in 0.1m increments, MAX.length : 1m)	05	0.5m											
	10		1m														

※ The length of a fiber probe will be short after repair when the optical fiber is broken.

Specifications

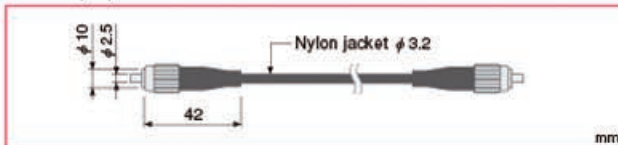
Type		FL-2000	FL-2400
Input point		1	4
Measurement range		-195.0~450.0°C	
Resolution		0.1°C	
Accuracy	Calibration not executed	-195.0~399.9°C : ±2°C, 400.0~450.0°C : ±5°C	
	Calibration executed	±0.5°C (within ±50°C of calibration point) (at an ambient temp. of 25°C±5°C)	
Temperature coefficient		± (0.01% of F.S. /°C) within operating temperature	
Operating environment		Temperature : 0~40°C, Humidity : 15~80%RH (non-condensing)	
Storage environment		Temperature : -10~50°C, Humidity : 10~85%RH (non-condensing)	
Display		Height of character : 15mm, RED LED	Height of character : 8mm, RED LED
Display update		1 s	
Light source		Blue LED	
Power supply	AC power	Please specify a power supply voltage when ordering (choose from 100 VAC, 115 VAC, or 230 VAC).	
	Dry battery	six AA-size alkaline batteries	—
Power consumption		approx. 12 VA	approx. 40 VA
Memory		Up to 15,000 data, one second interval (synchronized with display)	No memory
Interface		RS-232C Transfer rate : 9600bps Data formation : 7bit, odd parity, 1 stop bit	
Calibration		One-point calibration (using real temperature within a measured area)	
Analog output	Output rate	10mV/°C	
	Resolution	1mV	
	Accuracy	± (0.2% of F.S.) at an ambient temperature of 25°C ±5°C	
	Temperature coefficient	± (0.01% of F.S. /°C)	
External dimensions		210 (W) × 88 (H) × 230 (D) mm Protruded parts excluded	320 (W) × 99 (H) × 280 (D) mm Protruded parts excluded
Weight		approx. 3 kg	approx. 5 kg
Supplied accessories		Power cable (two-wire plug attached) × 1 Fuse (2A mini fuse) × 1 Analog output cable × 1 Communication cable × 1 PC software AMS-850 (CD ROM) × 1 User's manual (main unit and software) × 1	Power cable (two-wire plug attached) × 1 Fuse (2A mini fuse) × 1 Analog output cable × 4 Communication cable × 1 Conversion cable (RS-232C→USB) PC software AMS-850 (CD ROM) × 1 User's manual (main unit and software) × 1

Optional accessories

Extension cable

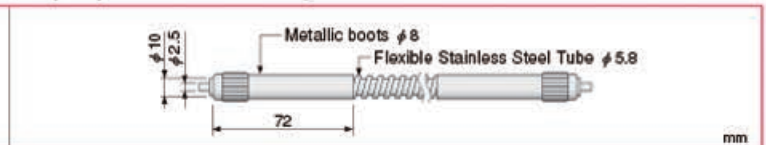
FK1-*M

General-purpose extension cable for normal use.



FK2-*M

Heavy-duty extension cable for rough environments.



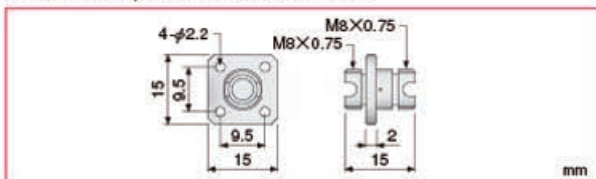
Replace the asterisk (*) in the model number with a cable length in meters. The extension cable cannot be used with FS600-*M (plastic fiber).

FA1 (Optical adapter) is required for the connection of fiber sensors and relay cables.

Optical adapter

FA1

Can connect a probe to an extension cable.

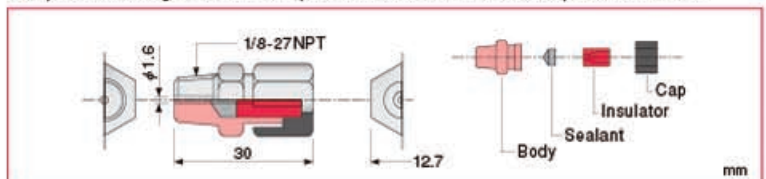


Compression fitting

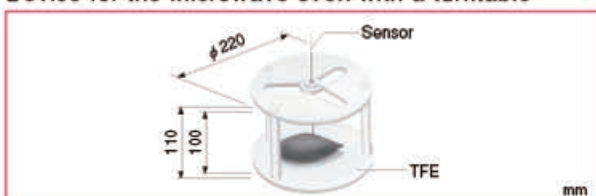
FN1-T (sealant material : TFE)

FN1-V (sealant material : Viton)

Compression fitting used to insert probe into a vacuum device or pressure vessel.



Device for the microwave oven with a turntable



Pressure rating 1.33×10⁻⁴Pa~11.0 MPa at 20°C using stainless steel rod

Various options can be tailored to meet special requirements. Please contact us for more information.