

Metis MY51 Self-Contained, Stand Alone Pyrometer Series for non-contact temperature measurement of glass

The Pyrometer Series *Metis MY51* with pyroelectric detector operates in a narrow spectral band at 5.14 μm , where glass above 1 mm thickness is completely opaque. In addition, uncoated soda lime glass has a low reflection value at this wavelength. The combination of these two elements exhibits a near "Black Body" condition when measuring glass surface temperature with the *Metis MY51* Series. It is the ideal choice for glass applications for forming, bending, tempering, annealing, sealing and hardening of glass in float, construction, automotive and lamp manufacturing processes. Optical and electronic components are contained in a rugged IP65 extruded aluminium housing and with its' companion water cooling jacket and air purge assembly can reliably operate in harsh industrial environments.



Chart 1: Temperature Ranges *Metis MY51*

Spectral Response	5.14 μm
Temperature Ranges	80 – 800°C 100 – 1000°C 300 – 1300°C 500 – 2500°C

Each temperature range of MY51 is available with different speed of response times of 5, 30, or 100ms. Slower response models offer better optical resolution (smaller spot size). To achieve effectively the best optical resolution of 200:1, the 100 ms version is supplied with fixed focus lenses only. Refer to **Chart 3** below

Lenses: The infrared energy radiated by the target is centered via focusable or fixed focus lenses directly on the detector. The focussing feature allows control of the cone of vision and offers the possibility to measure either a small spot (focused) or the average of a bigger spot (out of focus). Fixed focus lenses with larger diameter lenses collect more infrared energy and therefore provide smaller spot sizes. The lenses are made of calcium fluoride CaF_2 which is highly transparent in the visible and infrared regions up to 10 μm . If additional windows are used they must offer similar optical characteristics.

Chart 2: Focusable Lenses *Metis MY51*

Lens Type	Focus Distance	Model MY51 with 5 or 30 ms response time			
		Temperature Ranges			
		80 – 800°C	100 – 1000°C	300 – 1300°C	500 – 2500°C
		Spot Size	Spot Size	Spot Size	Spot Size
OM51-C0	110 mm	1.7 mm	1.2 mm	1.0 mm	0.8 mm
	150 mm	2.6 mm	2.2 mm	1.9 mm	1.2 mm
	200 mm	3.6 mm	3.0 mm	2.5 mm	1.8 mm
OM51-D0	190 mm	2.5 mm	2.1 mm	1.7 mm	1.3 mm
	400 mm	7.0 mm	5.8 mm	4.8 mm	3.6 mm
	680 mm	12.6 mm	10.5 mm	8.5 mm	6.5 mm
OM51-L0	260 mm	3.5 mm	2.9 mm	2.3 mm	1.8 mm
	1500 mm	27.6 mm	23 mm	18 mm	13.7 mm
	4000 mm	64 mm	62 mm	52 mm	37 mm

The detector is sensitive to infrared radiation in an area called **cone of vision**. For the spot size diameter at the shortest, medium and longest focal distances, Refer to **Chart 2**. The aperture diameter at the MY51 lens is approx. 16mm for full scale temperatures up to 1300°C, and 9mm for full scale temperatures above 1300°C. This area has to be kept free from any intervening objects. The spot size diameter for distances not given in the chart can be calculated by interpolation.

Chart 3: Fixed-Focus Lenses *Metis MY51* with response times of 5, 30 and 100 milliseconds

Temperature Ranges		80 - 800°C		100 - 1000°C		300 - 1300°C & 500 - 2500°C		
Response Times		100 ms	5 or 30ms	100 ms	5 or 30ms	100 ms	30 ms	5 ms
Lens Type	Tube Length *)	Focus Distance	Spot size	Spot size	Spot size	Spot size	Spot size	Spot size
OM51-0E	89 mm	185 mm	2.8 mm	3.9 mm	2.0 mm	2.8 mm	0.9 mm	1.3 mm
OM51-0F	89 mm	390 mm	3.5 mm	4.9 mm	2.5 mm	3.5 mm	1.2 mm	1.7 mm
OM51-0G	89 mm	820 mm	5.6 mm	9.5 mm	4.0 mm	6.8 mm	2.5 mm	3.0 mm
OM51-0H	45 mm	250 mm	3.5 mm	4.8 mm	2.5 mm	3.4 mm	1.4 mm	1.7 mm
OM51-0K	45 mm	600 mm	8.4 mm	9.8 mm	6.0 mm	7.0 mm	3.0 mm	3.8 mm

*) see drawing on back page

Spot size and different tube lengths of several fixed focus lenses available with Metis MY51 can be taken from **Chart 3**. The lenses with a longer tube length of 89 mm offer better optical resolution and therefore provide smaller spot sizes than with a tube length of 45mm. The aperture size at the MY51 fixed focus lens is **27 mm** for full scale temperatures up to 1300°C and **15 mm** for full scale temperatures above 1300°C.

Optical Alignment: *Metis MY51* Pyrometers offer two different techniques for aiming the sensor onto the target. The first and most popular method is the built-in laser pointer which is also helpful for focusing. The second solution is sight-through optics which includes a reticule in the viewfinder, that defines the target size. This method is used for applications where aiming onto hot incandescent target or down a long sight tube is required. The eye piece of MY51 sensor is equipped with an adjustable dimmable attenuation filter to protect the human eye from bright light that can be generated by a hot target.

Temperature Output Signals: *Metis* Pyrometers offer a variety of analog and digital output signals for displaying, recording, archiving and controlling of measured process temperatures. The isolated analog output is selectable from 0 to 4 - 20 mA. Zero- and full-scale temperatures are adjustable to cover any portion of the instrument's available temperature span to a minimum of 50°C. There is a choice of 2 digital communication interfaces: **RS 232** or **RS 485** max. 19.2 kBd.

Signal Filtering: For measuring and holding of the highest instantaneous temperature value a **peak picker** (maximum value storage) is installed to compensate interruptions or attenuations in radiation caused by bursts of steam, smoke or dust. It can be reset either automatically or manually by an external contact closure or periodically by user preset clear time. In the last case the highest temperature will be held in a dual storage and will be reset in only one of the two storages after preset clear time to avoid a decrease of the temperature output, should a short cold period appear just at the reset moment.

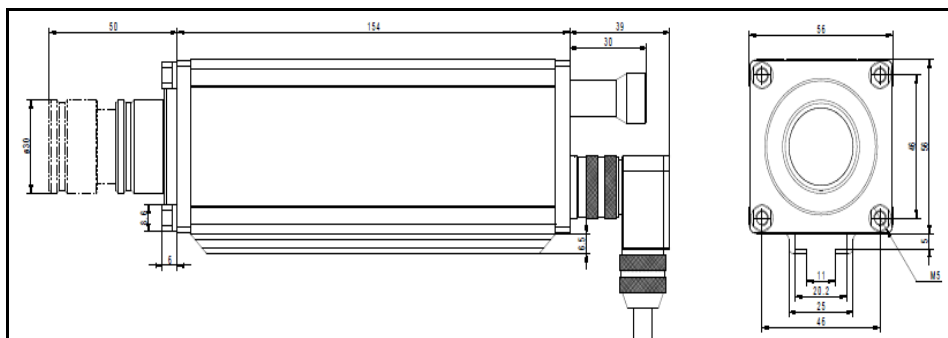
The **response time** is the length of time it takes for the output signal to reach 90% of a step change in measured temperature. It can be used to filter out rapid variations in temperature and achieve a "more stable" signal for control or display purposes.

Software: The *PSCwin Software* is available for automatic or manual set up of the pyrometer, for recording and for saving of graphical or table files. At the same time these files can be used for quality assurance purposes because the parameter settings are recorded as well. Minimum computer requirements: 500 MHz clock frequency and Windows 95, 98, ME or XP operating system.

Metis MY51 Specifications:

Measurement Accuracy:	1°C + 0.5% of difference between measured & housing temp. ($T_A = 23^\circ\text{C}$, $\epsilon = 1$, $t_{90} = 1 \text{ s}$)
Repeatability:	0.1% of measured temperature in °C + 0.2°C ($T_A = 23^\circ\text{C}$, $\epsilon = 1$, $t_{90} = 1 \text{ s}$)
Response Time t_{90}:	Depending on model, 5 ms, 30 ms or 100 ms adjustable up to 10 s
Analog Output Signal:	0 or 4 to 20 mA selectable, max. load 500 Ω
Emissivity Range:	0.20 to 1.00
Temperature Resolution:	Analog: < 0.1% of adjusted temperature range, digital 0.1°C
Ambient Temperature:	Pyrometer: operation 0 to 70°C, storage -20 to 80°C
Power Supply:	24 VDC (15 to 30 VDC), max. 2.5 VA
Isolation:	Power supply, analog and digital outputs are galvanically isolated from one another and from the housing
Housing and Rating:	Extruded aluminium profile, IP65
Weight:	1lb. 8 ounces (700 g)
CE Label:	according to EU directives for electromagnetic immunity
Laser Pointer:	650 nm, < 1 mW, class II per IEC 60825-1-3-4

Dimensions: *Metis MY51* with Focusable Lens and Interconnecting Cable

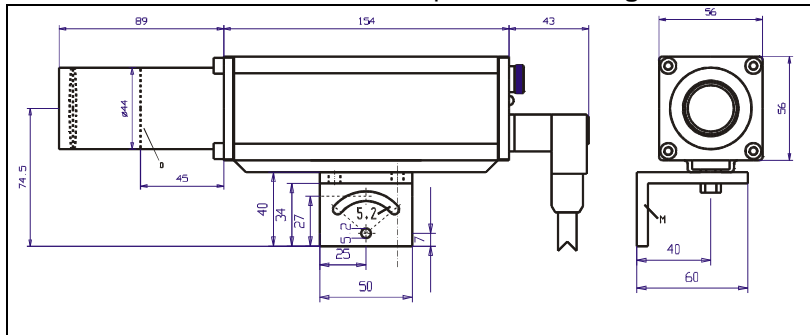


Water Cooling Jacket KG10-00 with Air Purge BL11-00

For use in ambient temperature up to 200°C



Metis with Fixed Focus Lens and optional Mounting Bracket HA10



Depending on order, length of lens tube is either 45 mm or 89 mm.

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Specifications are subject to change without notice. MY51_031314