

Metis Model MB35 - Self Contained Pyrometer Series

Pyrometer Series *Metis MB35* with temperature range starting at **35°C**, utilize a lead selenide detector with a filtered spectral response of **2 to 5 µm**. Applications include CO² laser heating/welding of metals, ceramics, composites and temperature measurement of metal surfaces above 35°C. The emissivity of metallic surfaces increase with shorter wavelengths, therefore offer much better performance than pyrometers with similar low scale temperature ranges, but with longer wavelength e.g. 8 - 14µm. Other major benefits are smaller spot sizes, fast response times and digital signal processing which provides for very wide temperature ranges. The MB35 is designed with its optical and electronic parts housed in a rugged IP65, extruded aluminium casting.

Lenses: The infrared energy radiated by the target is centered via a focusable or fixed focus lens directly on the detector. The easy to adjust focusing 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 size (out of focus condition). Fixed focus optics provide a larger diameter lens and therefore collects more infrared energy which results in smaller spot sizes and generally, lower zero scale temperature.

The lenses are made of calcium fluoride (CaF₂), which are highly transparent in the 2-5 µm spectral region. If additional windows are used, they must offer similar optical characteristics.

Chart 1: Focusable Lenses

Temperature Ranges:		50-700°C or 100-1000°C	35-700°C
Lens	Distance	Spot size	Spot size
OM35-A0	83 mm	0.7 mm	1.3mm
	93 mm	0.8 mm	1.4mm
	104 mm	0.9 mm	1.6mm
OM35-B0	130 mm	1.1 mm	2mm
	165 mm	1.6 mm	2.9mm
	195 mm	2.0 mm	3.6mm
OM35-C0	350 mm	3.0 mm	5.5mm
	600 mm	6.0 mm	11mm
	1000 mm	10.5 mm	19mm
	2000 mm	22 mm	40mm
	4000 mm	46 mm	83mm



The detector is sensitive to infrared radiation in an area called the “**cone of vision**”. Refer to [Chart 1](#) for the spot size diameter at the shortest, mid-range and longest variable focus distances. The cone of vision/aperture diameter at the optical lens is about **16 mm**. 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 2: Fixed-Focus Lenses

Temperature Ranges: 35 to 700°C or 50 to 1000°C

Lens	Length of Tube*	Distance	Spot size diameter	
			35-700°C	50-1000°C
OM35-0D	45 mm	200 mm	2.8 mm	2.5 mm
OM35-0E	89 mm	240 mm	2.1 mm	1.6 mm
OM35-0F	89 mm	350 mm	3.0 mm	2.4 mm
OM35-0G	45 mm	480 mm	5.8 mm	4.6 mm
OM35-0H	45 mm	1000 mm	12.2 mm	10 mm



*drawing on back page

The spot size and different lens tube lengths of several fixed focus lenses available with Metis MB35 can be taken from [Chart 2](#). The lenses with a longer lens tube of 89 mm, offer better optical resolution and therefore a smaller spot size. The cone of vision/aperture diameter at the optical lens is **27 mm**.

Optical Alignment: *Metis MB* infrared temperature sensors are available with 2 different solutions for aiming the sensor onto the target. The first and most popular method is the focusable built-in laser pointer. The second is sight-through optics with a circular reticule that defines the target size. This is advantageous for applications where aiming onto hot incandescent targets, viewing down long sight tubes or inside closed vessels is required.

Temperature Output Signals: *Metis* non-contact infrared thermometers offer a variety of analog and digital output signals for displaying, recording, archiving and controlling of measured process temperatures. The isolated analog output is switchable from 0 to 4 to 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. 57.6 kBd. (Optional Profibus DP)

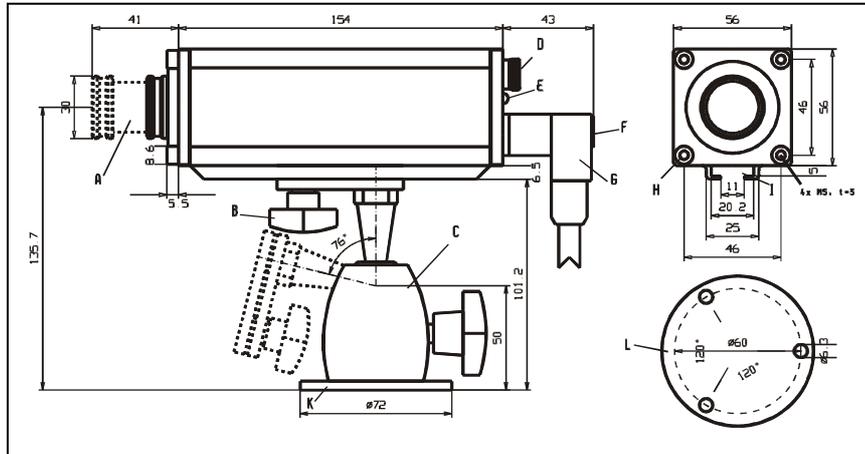
Signal Filtering: For measuring and holding of the highest instantaneous temperature value (**peak picker / maximum value storage**) is provided to compensate interruptions or attenuations in radiation caused by bursts of steam, smoke or dust in the IR sensor's cone of vision. It can be reset either automatically or manually by an external contact closure or periodically by user preset clear time. In this 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 during the exact the reset time. 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 storing of graphical data or table files. At the same time these files can be used for quality assurance purposes as the IR sensor parameter settings are recorded as well. Minimum computer requirements are: 500 MHz clock frequency and Windows 95, 98, ME, XP, Vista or Windows 7 operating system.

Additional Specifications:

Temperature ranges:	35-700°C, 50-700°C, or 100-1000°C; available with f ocusable lenses (Chart 1) 35-700°C or 50-1000°C available only with fixed fo cus lenses (Chart 2)
Spectral response:	2 to 5 µm
Measurement Uncertainty:	< 400°C: 2°C; > 400°C: 0.3 % of measured value in °C + 1 K
Repeatability:	0.1% of measured value in °C + 1 K
Response Time t_{90} :	3 ms with dynamic adaptation at low signal levels, adjustable up to 10 s
Emissivity adjustable range:	0.05 - 1.00
Analog Output Signal:	0 or 4 to 20 mA selectable, 500 Ω max. load
Digital Interface:	RS 232 or RS 485 max. 57.6 kBd. (optional Profibus DP)
Temperature Resolution:	analog < 0.1% of adjusted temperature range, digital 0.1°C
Ambient Temperature Range:	operation 0 to 53°C, stor age - 20 to 60°C
Power Supply:	24 VDC nominal (15 to 30 VDC operating range)
Isolation:	power supply, analog and digital outputs are galvanically isolated.
Housing and Rating:	extruded aluminium profile, IP 65 per DIN 40 050
Weight:	1.3 lbs., 600 g
CE Label:	according to EU directives for electromagnetic immunity
Laser Pointer:	650 nm, < 1 mW, class II per IEC 60825-1-3-4

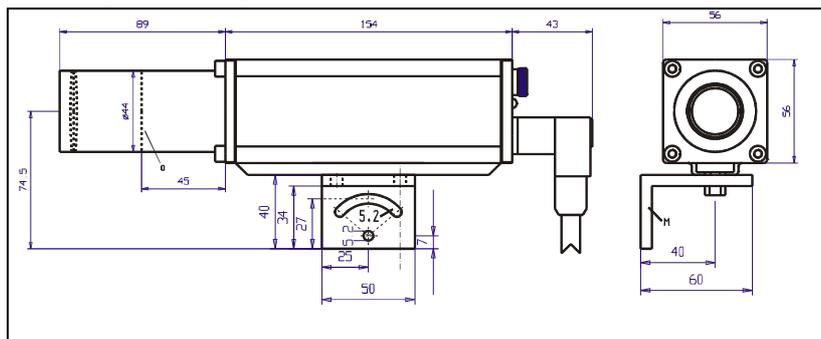
Dimensions: Metis MB35 with Focusable Lens and Swivel Base HA20



- A: Focusable Lens
- B: Fast-Mount Screw
- C: Swivel Mounting Base
- D: Eye Piece (for models with Sight through optics only)
- E: Operation LED
- F: Laser Push Button
- G: 12-pin Connector
- H: Front-Mount Threads
- I: Mounting Rail
- K: Swivel Base Mounting Flange
- L: Base View of item K with Mounting Holes
- M: Mounting Bracket

Metis MB35 with Fixed Focus Lens and Mounting Bracket HA10

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



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Notice: A variety of standard mounting, cooling, purging, IR window accessories etc. are available upon request.

Specifications are subject to be changed without notice.
 Metis MB35_090313