# More precision.

thermoMETER CTVideo/CSVideo // Infrared temperature sensors

- *Parallel use of video module and crosshair laser sighting for measuring field adjustment (measuring fields from 0.5mm)*

- *Applicable in ambient temperatures up to 70°C without any additional cooling*

- *Measurements on hot metals, ceramics and composite materials*

- *Automatic snapshot feature for process monitoring and corresponding documentation*

The video pyrometers thermoMETER CTVideo and CSVideo measure within the range from 50°C to 2200°C and are therefore ideally suited to high temperature applications. Response times from 1ms enable to integrate them fast and easily into the processes. The vario lenses allow for stepless focusing from a measurement distance of 90mm. Smallest objects from 0.5mm can therefore be measured reliably.
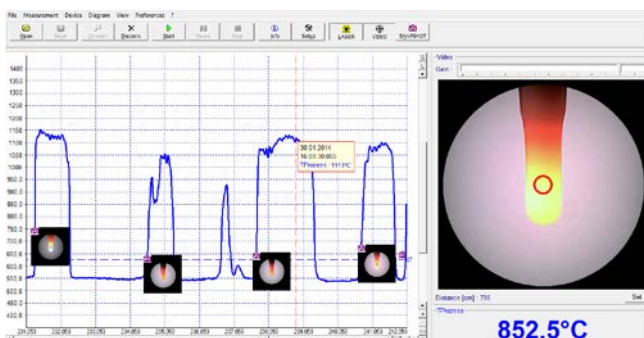
Software thermoMETER CTVideo and CSVideo

- Automatic snapshots (time- or temperature-dependent) for process monitoring and corresponding documentation
- Graphic display and recording of the measurement values
- Programming of sensor parameters and signal processing features
- Sensor remote monitoring

Operation modes (CS Video)

Analogue operation mode: 4-20mA and alarm interface. Setup & installation via USB cable (hot Plug & Play)
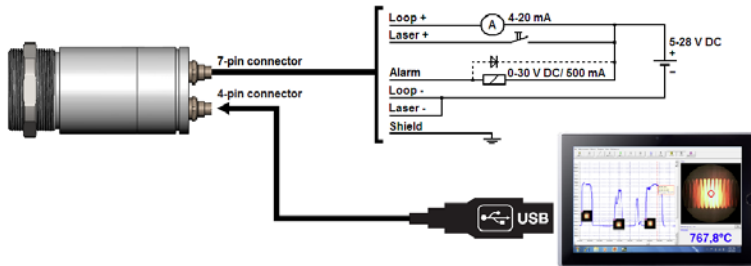
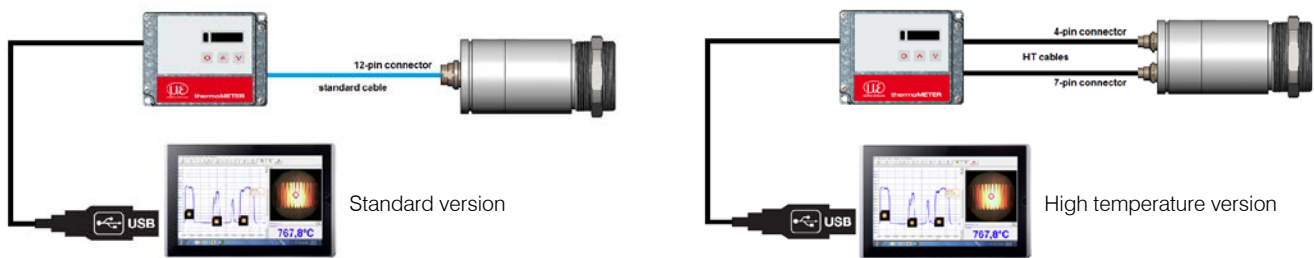Digital operation mode: process control (Video and temperature) via software
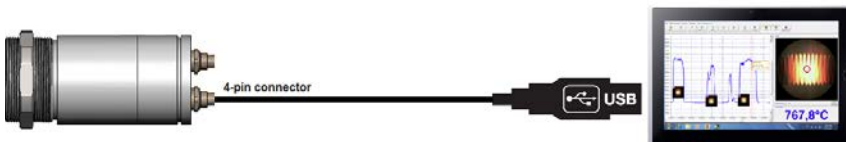
Operation modes (CT Video)

Digital operation mode

Standard version

High temperature version

Analogue operation mode: 0-5V, 0-10V, 0-20mA and 4-20mA
parallel to USB interface

- *Measuring range from 250 to 1600°C*
- *Optical resolution 150:1 / 300:1*
- *Spectral range 1.6µm*
- *Temperature value triggering with automatic snapshot*
- *Software Compact Connect included*
- *Parallel use of video module and crosshair laser sighting*
- *Manual focusing for measurement distances from 90mm*
- *Response times from 10ms*

The video pyrometer thermoMETER CSVideo 2M combines the innovative crosshair laser sighting with a video module as visor assistance. It guarantees a reliable and precise measuring field adjustment in hard-to-reach areas and in cases of measurement objects being so hot that the laser visor is not visible anymore.

CSVideo is equipped with an integrated controller. As the entire electronics is in the sensor, the CSVideo is particularly suitable for applications in restricted construction spaces.

Optical parameters thermoMETER CSVideo M2
▫ = smallest spot size (mm)

| Standard Focus									
SF150L	150:1	1.3	2.0	3.0	4.7	7.3	10.7	16.7	33.3
SF300H	300:1	0.7	1.0	1.5	2.3	3.7	5.3	8.3	16.7
distance (mm)		200	300	450	700	1100	1600	2500	5000
Close Focus									
CF150L	150:1	0.6	0.8	1.0	1.2	1.4	1.7		
CF300H	300:1	0.3	0.4	0.5	0.6	0.7	0.8		
distance (mm)		90	120	150	180	210	250		

- The vario lenses of the CSVideo allow for stepless focusing from the desired measurement distance.
- The sensors are available in two lens versions:
  Standard focus (SF): adjustable from 200mm to infinity
  Close focus (CF): adjustable from 90mm to 250mm
- The following table contains examples of different measurement distances and the corresponding spot diameters:

Model	CSVM-2LSF-C5	CSVM-2LCF-C5	CSVM-2HSF-C5	CSVM-2HCF-C5
Optical resolution	150:1	150:1	300:1	300:1
Temperature range [1]	250°C to 800 °C		385°C to 1600°C	
Spectral range	1.6µm			
System accuracy [2,3]	±0.3% of reading +2°C			
Repeatability [2]	±0.1% of reading +1°C			
Temperature resolution	0.1K			
Response time (90% signal)	10ms			
Emissivity/Gain [1]	0.100 to 1.100			
Transmissivity/Gain [1]	0.100 to 1.000			
Signal processing [1]	peak hold, valley hold, average; extended hold function with threshold and hysteresis			
Certificate of calibration	optional			
Outputs/analogue	4 to 20mA			
Output impedances	max. 1000Ω (In dependence on supply voltage)			
Alarm output	open-collector (0 to 30V / 500mA)			
Outputs/digital	USB 2.0, Ethernet (via optional USB server)			
Video sighting	digital (USB 2.0), 640 x 480 px, FOV 3.1° x 2.4°			
Cable length (analogue + alarm)	3m, 8m, 15m			
Cable length (USB)	5m (incl.), 10m, 20m, 100m (via Ethernet)			
Current draw (laser)	45mA at 5V ; 20mA at 12V ; 12mA at 24V			
Power supply	5 to 28V DC			
Laser	class II, 635nm, 1mW, Laser ON/OFF via controller or software			
Environmental rating	IP 65 (NEMA-4), front mountable at vacuum processes (up to 10 - 3 mbar)			
Ambient temperature	-20°C to 70°C (50°C with Laser ON)			
Storage temperature	-40°C to 85°C			
Relative humidity	10 to 95%, non condensing			
Vibration sensor	IEC 68-2-6: 3 G, 11 up to 200Hz, any axis			
Shock sensor	IEC 68-2-27: 50 G, 11ms, any axis			
Weight	600g			

[1] adjustable via programming keys or software
[2] at ambient temperature 23 ±5°C; whichever is greater
[3] temperature of the object >0°C
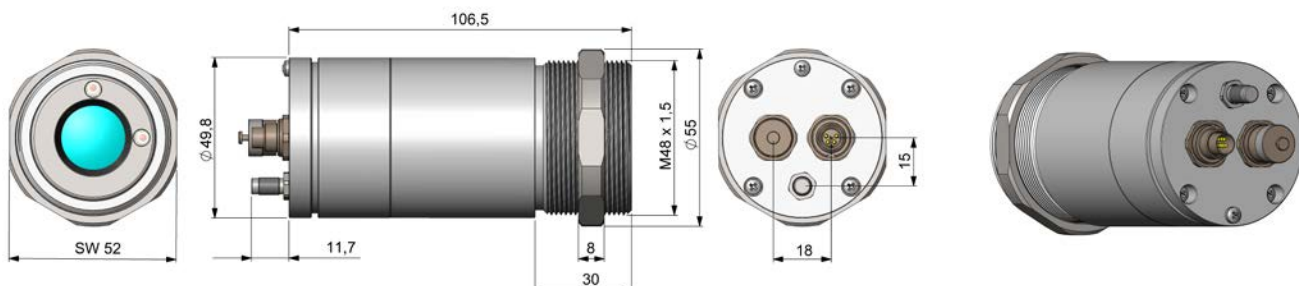
- *Measuring range from 250 to 2200°C*
- *Optical resolution 150:1 / 300:1*
- *Spectral range 1.0 and 1.6µm*
- *Response time 1ms*
- *Temperature value triggering with automatic snapshot*
- *Software Compact Connect included*
- *Parallel use of video module and crosshair laser sighting*
- *Manual focusing for measurement distances from 90mm*

The infrared video thermometers CTVideo M1/M2 allow a parallel use of video sighting and crosshair laser aiming for an optimal measuring field adjustment even in processes with limited access. Due to the short wave-length of 1.0µm and 1.6µm, the sensor reliably measures temperatures of metals or ceramics and reduces possible measuring errors with surfaces with low or unknown emissivity.

Optical parameters thermoMETER CTVideo M1/M2
▫ = smallest spot size (mm)

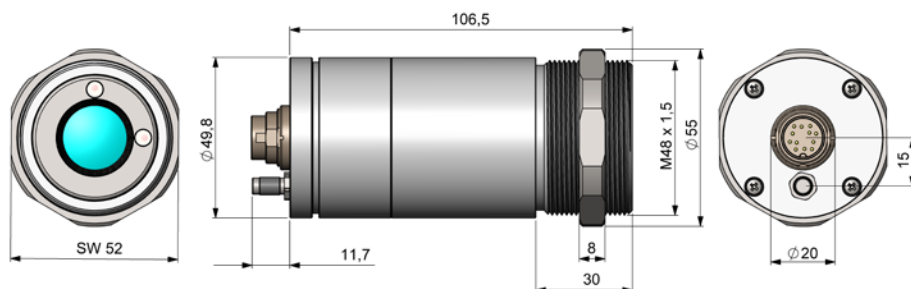| Standard Focus									
SF150L	150:1	1.3	2.0	3.0	4.7	7.3	10.7	16.7	33.3
SF300H/H1	300:1	0.7	1.0	1.5	2.3	3.7	5.3	8.3	16.7
distance (mm)		200	300	450	700	1100	1600	2500	5000
Close Focus									
CF150L	150:1	0.6	0.8	1.0	1.2	1.4	1.7		
CF300H/H1	300:1	0.3	0.4	0.5	0.6	0.7	0.8		
distance (mm)		90	120	150	180	210	250		

- The vario lenses of the CTVideo allow for stepless focusing from the desired measurement distance.
- The sensors are available in two lens versions:
  Standard focus (SF): adjustable from 200mm to infinity
  Close focus (CF): adjustable from 90mm to 250mm
- The following table contains examples of different measurement distances and the corresponding spot diameters:

Model	CTVM-1LSF-C3	CTVM-1HSF-C3	CTVM-1H1SF-C3	CTVM-2LSF-C3	CTVM-2HSF-C3	CTVM-2H1SF-C3
Optical resolution	150:1	300:1	300:1	150:1	300:1	300:1
Temperature range [1]	485°C to 1050°C	650°C to 1800°C	800°C to 2200°C	250°C to 800°C	385°C to 1600°C	490°C to 2000°C
Spectral range	1.0μm			1.6μm		
System accuracy [2,3]	±0.3% of reading +2°C					
Repeatability [2]	±0.1% of reading +1°C					
Temperature resolution	0.1K	0.2K	0.2K	0.1K	0.2K	0.2K
Response time (90% signal)	1ms					
Emissivity/Gain [1]	0.100 to 1.100					
Transmissivity/Gain [1]	0.100 to 1.000					
Signal processing [1]	peak hold, valley hold, average; extended hold function with threshold and hysteresis					
Certificate of calibration	optional					
Outputs/analogue	0/4 - 20mA, 0-5/10V thermocouple J, K					
Output impedances	mA max. 500Ω (with 8-36 V DC) mV min. 100kΩ load impedance thermocouple 20Ω					
Inputs	programmable functional inputs for external emissivity adjustment, ambient temperature compensation, trigger (reset of hold functions)					
Alarm output	open-collector (24V / 50mA)					
Outputs/digital	USB 2.0, Ethernet (via optional USB server)					
Video sighting	digital (USB 2.0) 640 x 480 px, FOV 3.1° x 2.4°					
Cable length (sensor-electronics)	3m (Standard), 5m, 10m					
Cable length (USB)	5m, extendable up to 100m over Ethernet					
Current draw	max. 160mA					
Power Supply	8-36V DC					
Laser	class II, 635nm, 1mW, Laser ON/OFF via controller or software					
Environmental rating	IP 65 (NEMA-4), front mountable at vacuum processes (up to 10 - 3 mbar)					
Ambient temperature	-20°C to 85°C (50°C with Laser ON)					
Storage temperature	-40°C to 85°C					
Relative humidity	10 to 95%, non condensing					
Vibration　　　　　　sensor	IEC 68-2-6: 3 G, 11 up to 200Hz, any axis					
Shock　　　　　　　sensor	IEC 68-2-27: 50 G, 11ms, any axis					
Weight　　sensing head	600g					
electronics	420g					

[1] adjustable via programming keys or software
[2] at ambient temperature 23 ±5°C; whichever is greater
[3] temperature of the object >0°C

- *Measuring range from 50 to 1800°C*
- *Optical resolution 60:1/100:1/300:1*
- *Spectral range 2.3µm*
- *Response time 1ms*
- *Temperature value triggering with automatic snapshot*
- *Software Compact Connect included*
- *Parallel use of video module and crosshair laser sighting*
- *Manual focusing for measurement distances from 90mm*

The infrared video thermometer CTVideo M3 allows a parallel use of video sighting and crosshair laser aiming for an optimal measuring field adjustment even in processes with limited access. Due to the short wave-length of 2.3µm, the sensor reliably measures temperatures of metals or composite material and reduces possible measuring errors with surfaces with low or unknown emissivity.

Optical parameters thermoMETER CTVideo M3
▫ = smallest spot size (mm)

Standard Focus									
SF-60L	60:1	3.3	5.0	7.5	11.7	18.3	26.7	41.7	83.3
SF100H	100:1	2.0	3.0	4.5	7.0	11.0	16.0	25.0	50.0
SF300H1/H2/H3	300:1	0.7	1.0	1.5	2.3	3.7	5.3	8.3	16.7
distance (mm)		200	300	450	700	1100	1600	2500	5000
Close Focus									
CF-60L	60:1	1.5	2.0	2.5	3.0	3.5	4.2		
CF100h	100:1	0.9	1.2	1.5	1.8	2.1	2.5		
CF300H1/H2/H3	300:1	0.3	0.4	0.5	0.6	0.7	0.8		
distance (mm)		90	120	150	180	210	250		

- The vario lenses of the CTVideo allow for stepless focusing from the desired measurement distance.
- The sensors are available in two lens versions:
  Standard focus (SF): adjustable from 200mm to infinity
  Close focus (CF): adjustable from 90mm to 250mm
- The following table contains examples of different measurement distances and the corresponding spot diameters:
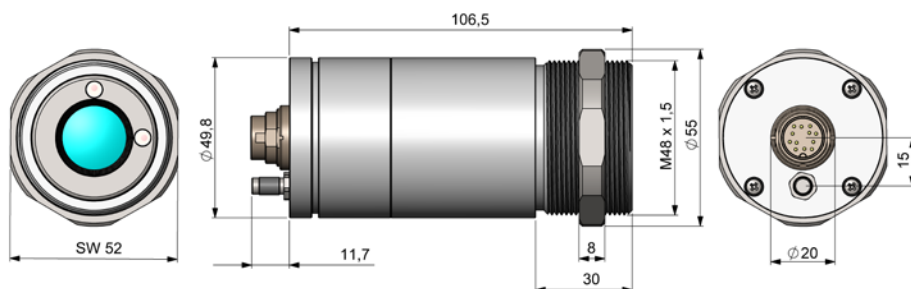
| Modell	CTVM-3LSF-C3	CTVM-3HSF-C3	CTVM-3H1SF-C3	CTVM-3H2SF-C3	CTVM-3H3SF-C3
Optical resolution	60:1	100:1	300:1		
Temperature range [1]	50°C to 400°C	100°C to 600°C	150°C to 1000°C	200°C to 1500°C	250°C to 1800°C
Spectral range	2.3µm				
System accuracy [2,3]	±0.3% of reading +2°C				
Repeatability [2]	±0.1% of reading +1°C				
Temperature resolution	0.1K				
Response time (90% signal)	1ms				
Emissivity/Gain [1]	0.100 to 1.100				
Transmissivity/Gain [1]	0.100 to 1.000				
Signal processing [1]	peak hold, valley hold, average; extended hold function with threshold and hysteresis				
Certificate of calibration	optional				
Outputs/analogue	0/4 - 20mA, 0-5/10V thermocouple J, K				
Output impedances	mA max. 500Ω (with 8-36 V DC) mV min. 100kΩ load impedance thermocouple 20Ω				
Inputs	programmable functional inputs for external emissivity adjustment, ambient temperature compensation, trigger (reset of hold functions)				
Alarm output	open-collector (24V / 50mA)				
Outputs/digital	USB 2.0, Ethernet (via optional USB server)				
Video sighting	digital (USB 2.0) 640 x 480 px, FOV 3.1° x 2.4°				
Cable length (sensor-electronics)	3m (Standard), 5m, 10m				
Cable length (USB)	5m, extendable up to 100m over Ethernet				
Current draw	max. 160mA				
Power Supply	8-36V DC				
Laser	class II, 635nm, 1mW, Laser ON/OFF via controller or software				
Environmental rating	IP 65 (NEMA-4), front mountable at vacuum processes (up to 10 - 3 mbar)				
Ambient temperature	-20°C to 85°C (50°C with Laser ON)				
Storage temperature	-40°C to 85°C				
Relative humidity	10 to 95%, non condensing				
Vibration sensor	IEC 68-2-6: 3 G, 11 up to 200Hz, any axis				
Shock sensor	IEC 68-2-27: 50 G, 11ms, any axis				
Weight sensing head	600g				
electronics	420g				

[1] adjustable via programming keys or software
[2] at ambient temperature 23 ±5°C; whichever is greater
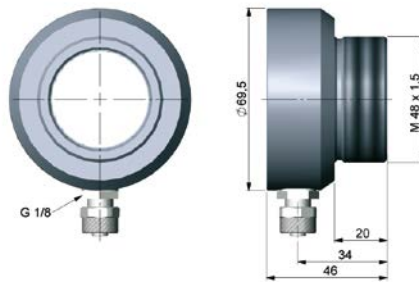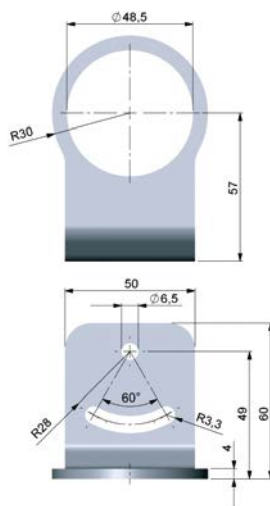[3] temperature of the object >0°C

Water cooled housing
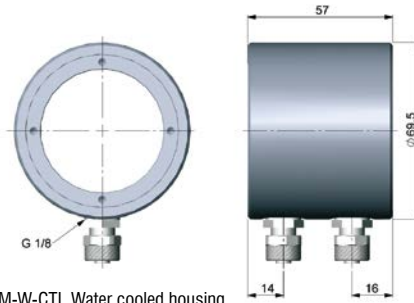
TM-W-CTL Water cooled housing
Hose connection: 6x8mm
Thread (Fitting): G 1/8 inches
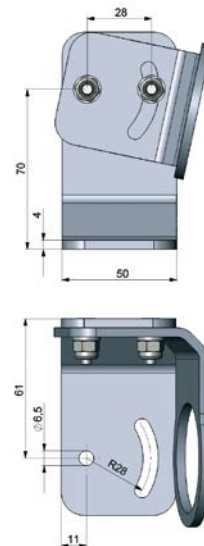
Air purge collar

TM-AP-CTL Air purge collar
Hose connection: 6x8mm
Thread (Fitting): G 1/8 inches
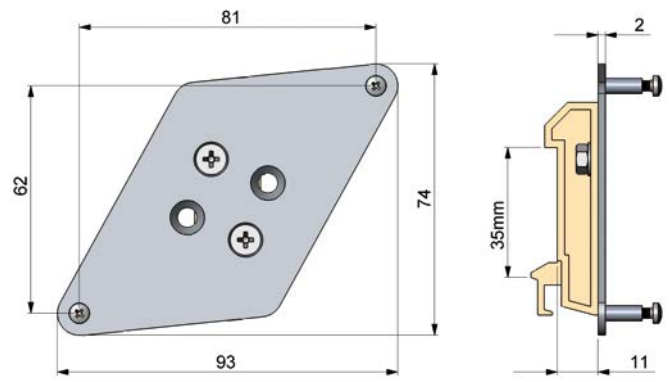
Mounting bracket

TM-FB-CTL Mounting bracket (fixed);
included in delivery

TM-AB-CTL Mounting bracket (adjustable)

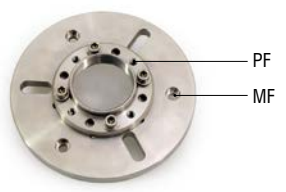**Rail mount adapter for controller**

TM-RAIL-CTL Rail mount adapter

Furnace wall mount

TM-RM-CTL Furnace wall mount accessory for TM-MF-CTL,
TM-PF-CTL, TM-AST300-CTL and TM-PA-CTL

Mounting flange

TM-PF-CTL and TM-MF-CTL Mounting flange M48x1,5 for
direct mounting a sensor

High performance sensors made by Micro-Epsilon

Sensors and systems for displacement and position

Sensors and measurement devices for non-contact temperature measurement

2D/3D profile sensors (laser scanner)

Optical micrometers, fibre optic sensors and fibre optics

Colour recognition sensors, LED analyzers and colour online spectrometer

Measurement and inspection systems

MICRO-EPSILON