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More precision

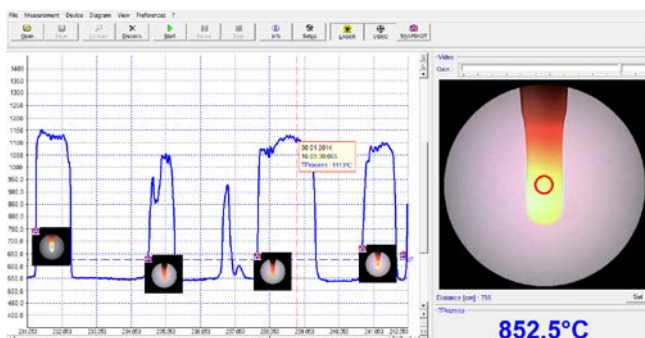
thermoMETER CTVideo/CSVideo // Infrared temperature sensors





- 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.

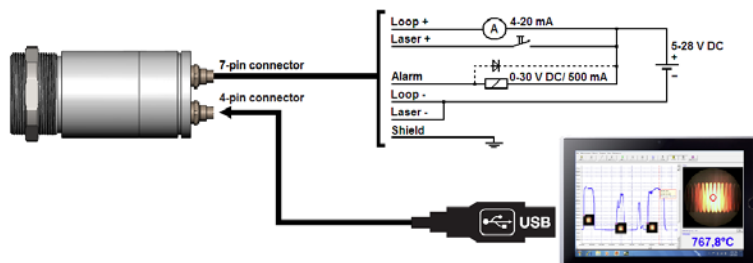


Software thermoMETER CTVideo and CSVideo

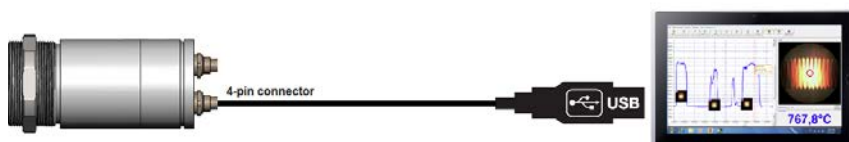
- Automatic snapshots (time- or temperature-dependent) for process monitoring and corresponding documentation
- Graphic display and recording of the measurement values
- Programming of sensor parameters and signal processing features
- Sensor remote monitoring

Operation modes (CS Video)

Analog operation mode: 4-20mA and alarm interface. Setup & installation via USB cable (hot Plug & Play)

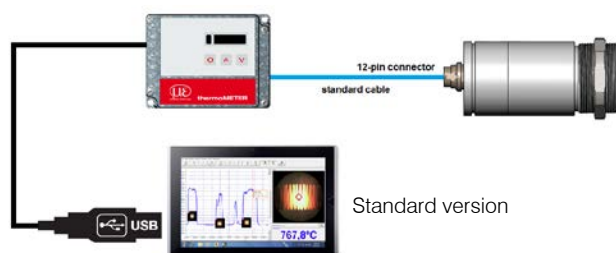


Digital operation mode: process control (Video and temperature) via software

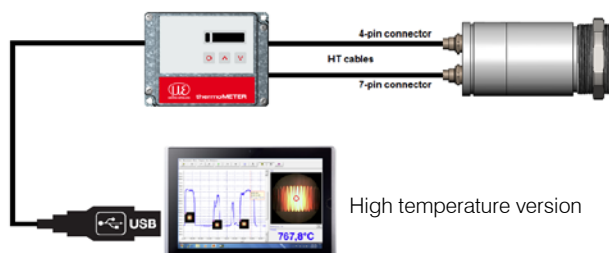


Operation modes (CT Video)

Digital operation mode



Standard version



High temperature version

Analog 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 | | |

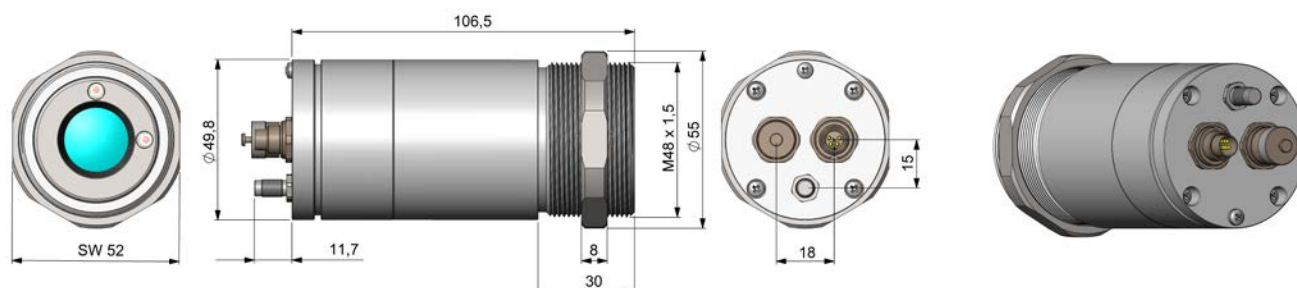
- The vario lenses of the CSVideo allow for stepless focusing from the desired measurement distance.
- The sensors are available in two lens versions:
Standard focus (SF): adjustable from 200mm to infinity
Close focus (CF): adjustable from 90mm to 250mm
- The following table contains examples of different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

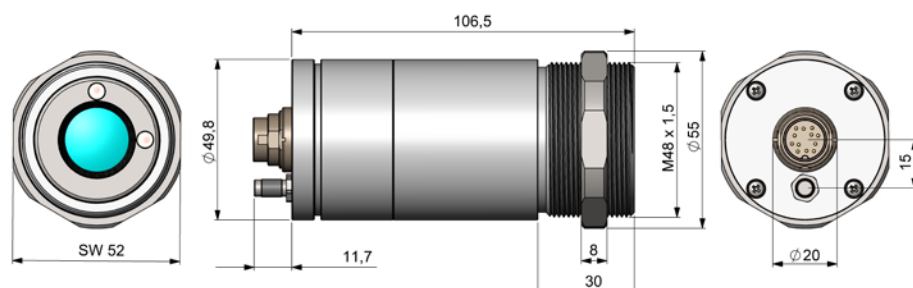
- The vario lenses of the CTVideo allow for stepless focusing from the desired measurement distance.
- The sensors are available in two lens versions:
Standard focus (SF): adjustable from 200mm to infinity
Close focus (CF): adjustable from 90mm to 250mm
- The following table contains examples of different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

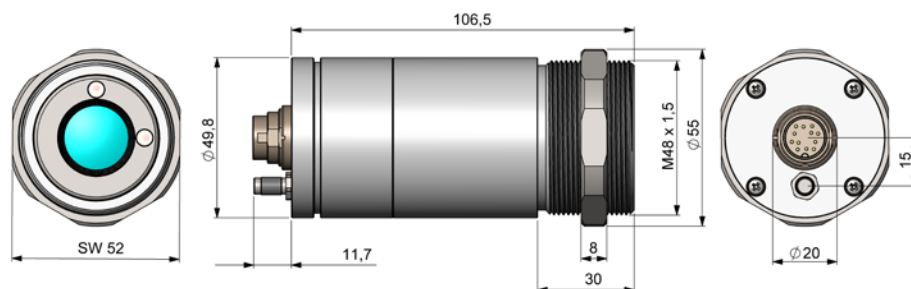
- The vario lenses of the CTVideo allow for stepless focusing from the desired measurement distance.
- The sensors are available in two lens versions:
Standard focus (SF): adjustable from 200mm to infinity
Close focus (CF): adjustable from 90mm to 250mm
- The following table contains examples of different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

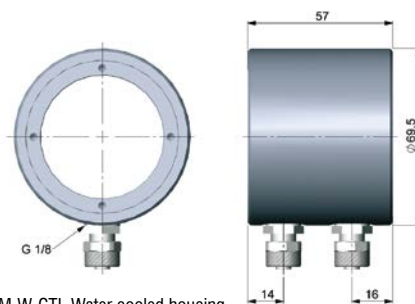
¹ adjustable via programming keys or software

² at ambient temperature 23 ±5°C; whichever is greater

³ temperature of the object >0°C

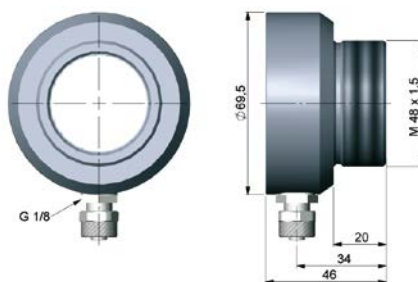


Water cooled housing



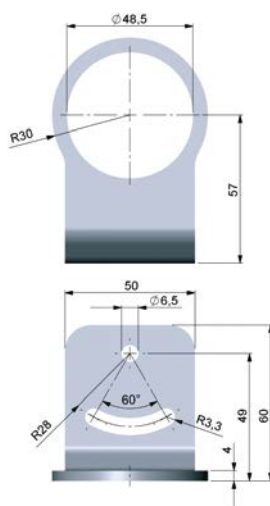
TM-W-CTL Water cooled housing
Hose connection: 6x8mm
Thread (Fitting): G 1/8 inches

Air purge collar

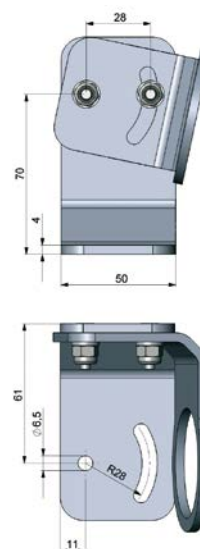


TM-AP-CTL Air purge collar
Hose connection: 6x8mm
Thread (Fitting): G 1/8 inches

Mounting bracket

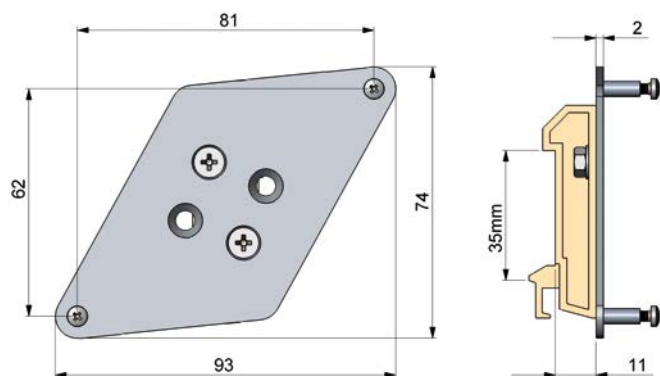


TM-FB-CTL Mounting bracket (fixed);
included in delivery



TM-AB-CTL Mounting bracket (adjustable)

Rail mount adapter for controller



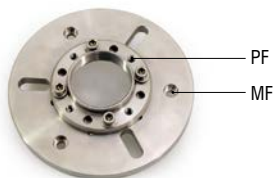
TM-RAIL-CTL Rail mount adapter

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 fiber optics



Color recognition sensors, LED analyzers and color online spectrometer



Measurement and inspection systems