Instruction Manual

Cooling Jacket Advanced

Cooling Jacket Advanced
Cooling Jacket Advanced Extended
Cooling housing for TIM series, video pyrometer and laser pyrometer at high ambient temperatures
# Table of contents

1  **General Notes** ............................................................................................................................ 7
   1.1  Intended Use ............................................................................................................................... 7
   1.2  Warranty .................................................................................................................................... 8
   1.3  Scope of Supply .......................................................................................................................... 9
      1.3.1  Versions ................................................................................................................................. 9
   1.4  Mounting Accessories ............................................................................................................... 10
      1.4.1  Accessories for TIM NetBox .............................................................................................. 10
      1.4.2  Accessories for USB Server Gigabit ................................................................................... 11

2  **Technical Data** .......................................................................................................................... 12
   2.1  General Specifications ............................................................................................................... 12
      2.1.1  Focusing Unit and Front Part ............................................................................................ 13
   2.2  Accessories ............................................................................................................................... 14
<table>
<thead>
<tr>
<th>3.2.2</th>
<th>Assembling of the Front Part</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2.3</td>
<td>Assembling to the Cooling Jacket Advanced</td>
<td>32</td>
</tr>
<tr>
<td>3.2.4</td>
<td>Assembling to the Cooling Jacket Advanced Extended</td>
<td>42</td>
</tr>
<tr>
<td>4</td>
<td>Example of Installation</td>
<td>54</td>
</tr>
</tbody>
</table>
1 General Notes

1.1 Intended Use
The cooling housing Cooling Jacket Advanced is intended to use for TIM series, video thermometers CTVideo and CSVideo as well as CTLaser and CSLaser for application at high ambient temperatures.

- Read the manual carefully before the initial start-up. The producer reserves the right to change the herein described specifications in case of technical advance of the product.

- In case of problems or questions which may arise when you use the infrared camera, please contact our service department.

- All accessories can be ordered according to the referred part numbers in brackets [ ].
1.2 Warranty

All components of the device have been checked and tested for perfect function in the factory. In the unlikely event that errors should occur despite our thorough quality control, this should be reported immediately to MICRO-EPSILON.

The warranty period lasts 12 months following the day of shipment. Defective parts, except wear parts, will be repaired or replaced free of charge within this period if you return the device free of cost to MICRO-EPSILON. This warranty does not apply to damage resulting from abuse of the equipment and devices, from forceful handling or installation of the devices or from repair or modifications performed by third parties.

No other claims, except as warranted, are accepted. The terms of the purchasing contract apply in full. MICRO-EPSILON will specifically not be responsible for eventual consequential damages. MICRO-EPSILON always strives to supply the customers with the finest and most advanced equipment. Development and refinement is therefore performed continuously and the right to design changes without prior notice is accordingly reserved.

For translations in other languages, the data and statements in the German language operation manual are to be taken as authoritative.
1.3 Scope of Supply

1.3.1 Versions

Cooling Jacket Advanced

- Cooling Jacket Advanced for TIM series (Part-No.: TM-CJAxxxx-TIM), consisting of housing and chassis
  The focusing unit or the front part must be ordered separately.
- Cooling Jacket Advanced for CSLaser, CTLaser as well as CTVide and CSVideo (Part-No.: TM-CJA-CTL)
  The front part must be ordered separately.
- Installation instructions

Cooling Jacket Advanced Extended

- Cooling Jacket Advanced for TIM series (Part-No.: TM-CJAExxx-TIM), consisting of housing and chassis
- Cooling Jacket Advanced for CSLaser, CTLaser as well as CTVide and CSVideo (Part-No.: TM-CJAE-CTL), consisting of housing and chassis
  The front part must be ordered separately.
- incl. mounting accessories for
  - TIM NetBox or USB server Gigabit
  - Industrial PIF
  - Installation instructions

Operation without focusing and front attachment is not possible.
1.4 Mounting Accessories

1.4.1 Accessories for TIM NetBox

Figure 1: Accessories for TIM NetBox

1 Support rods for Industrial PIF (2x distance bolt SW 5,5x6 - M3x6, 2x cylinder head screw M3x10 and 2x cylinder head screw M3x5)
2 Shaft for fixing the TIM NetBox
3 Holding plate (2x cylinder head screw M3x5)
4 Fastening rail (4x cylinder head screw M4x8)
1.4.2 Accessories for USB Server Gigabit

Figure 2: Accessories for USB-Server Gigabit

1 DIN rail plate for fixing the USB server Gigabit
2 Distance rings
3 Screws
4 Support rods for Industrial PIF, with thread and without
## 2 Technical Data

### 2.1 General Specifications

<table>
<thead>
<tr>
<th></th>
<th>Cooling Jacket Advanced</th>
<th>Cooling Jacket Advanced Extended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental rating</td>
<td>IP 65</td>
<td>IP 65</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>up to 315 °C(^1)</td>
<td>up to 315 °C(^1)</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>10 ... 95 %, non-condensing</td>
<td>10 ... 95 %, non-condensing</td>
</tr>
<tr>
<td>Material (housing)</td>
<td>V2A</td>
<td>V2A</td>
</tr>
<tr>
<td>Dimensions</td>
<td>271 mm x 166 mm x 182 mm</td>
<td>426 mm x 166 mm x 182 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>5.7 kg</td>
<td>7.8 kg</td>
</tr>
<tr>
<td>Air purge collar</td>
<td>G1/4&quot; Internal thread</td>
<td>G1/4&quot; Internal thread</td>
</tr>
<tr>
<td></td>
<td>G3/8&quot; External thread</td>
<td>G3/8&quot; External thread</td>
</tr>
<tr>
<td>Cooling water fittings</td>
<td>G1/4&quot; Internal thread</td>
<td>G1/4&quot; Internal thread</td>
</tr>
<tr>
<td></td>
<td>G3/8&quot; External thread</td>
<td>G3/8&quot; External thread</td>
</tr>
<tr>
<td>Cooling water pressure</td>
<td>15 bar (217 psi)</td>
<td>15 bar (217 psi)</td>
</tr>
</tbody>
</table>

\(^1\) *Cable available up to 250 °C ambient temperature as well as cable cooling up to 315 °C.*
2.1.1 Focusing Unit and Front Part

Is needed for mounting a thermoIMAGER TIM or pyrometer.

**Focusing unit**

for 6°, 41° and 72° optics (Part-No.: TM-CJAFU6-TIM)

for 23° optics (Part-No.: TM-CJAFU23-TIM)

**Focusing unit**

for 13° optics (Part-No.: TM-CJAFU13-TIM)

for 33° (TIM 640), 38° and 62° optics (Part-No.: TM-CJAFU38)

**Front part**

for TIM 2xx (Part-No.: TM-CJAFP2xx-TIM)
2.2 Accessories

2.2.1 High Temperature Cable

High temperature Ethernet cable cat.6 (180 °C), 10 m, incl. 2x RJ45 connector
[Part-No.: TM-CJAETC10H-TIM]

High temperature Ethernet cable cat.6 (180 °C), 20 m, incl. 2x RJ45 connector
[Part-No.: ACCJAETCB20H]

High temperature Ethernet cable cat.6 (250 °C), 10 m, incl. 2x RJ45 connector
[Part-No.: ACCJAETCB10H2]

High temperature Ethernet cable cat.6 (250 °C), 20 m, incl. 2x RJ45 connector
[Part-No.: ACCJAETCB20H2]

High temperature USB cable (180 °C/ 250 °C), 5 m and 10 m

Pyrometer cable (available separately)
2.2.2 Protection Window

Adequate protection windows are available for all versions.

2.2.3 Additional Accessories

Industrial PIF without housing (Part-No.: TM-CJAPIF500V2-TIM), 500 VAC\text{RMS} isolation voltage between TIM and process, 25 cm connection cable
2.3 Dimensions
Cooling Jacket Advanced

Figure 3: Cooling Jacket Advanced - side view
Figure 4: Cooling Jacket Advanced - top view
Figure 5: Cooling Jacket Advanced - front view
Cooling Jacket Advanced Extended

Figure 6: Cooling Jacket Advanced Extended - side view
Figure 7: Cooling Jacket Advanced, extended version - top view
Figure 8: Cooling Jacket Advanced, extended version - front view
2.4 Fittings

2.4.1 Cooling Water Fitting

- The cooling water input and output has a G1/4"-internal thread and a G3/8"-external thread.

- The maximum cooling water pressure is 15 bar (271 psi).

- While connecting the hoses keep inclined the Cooling Jacket at an angle of approx. 45° to avoid air bubbles.

2.4.2 Air Purge Collar

- Use oil-free, technically clean air only.

- The needed amount of air (approx. 2 ... 10 l/ min.) depends on the application and the installation conditions on-site.

- The air purge collar has a G1/4"-internal thread and a G3/8"-external thread.
The lens must be kept clean at all times from dust, smoke, fumes and other contaminants in order to avoid reading errors. These effects can be reduced by using an air purge collar.

### 2.5 Cooling Properties

<table>
<thead>
<tr>
<th>Flow</th>
<th>Temperature at 1 l/min</th>
<th>Temperature at 2.5 l/min</th>
<th>Temperature at 5 l/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>Cooling water input [°C]</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>[255 °C]</td>
<td>Camera/ Thermometer [°C]</td>
<td>36</td>
<td>34</td>
</tr>
</tbody>
</table>

**Table 1:** Cooling properties with a steady cooling water input temperature and various flow

<table>
<thead>
<tr>
<th>Flow</th>
<th>Temperature at 2.5 l/min of flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>Cooling water input [°C]</td>
</tr>
<tr>
<td>[255 °C]</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Camera/ Thermometer [°C]</td>
</tr>
<tr>
<td></td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>51</td>
</tr>
</tbody>
</table>

**Table 2:** Cooling properties with a steady flow and various cooling water input temperature
2.5.1 Condensation

- For applications at ambient temperatures until 100 °C and a high humidity there is danger of condensation (see Table 3).
- To avoid condensation, the temperature of the cooling media and the flow rate must ensure a minimum device temperature.
- Consider the operation temperature of the applied devices.

Example (see Table 3):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>80 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>25 %</td>
</tr>
<tr>
<td>Minimum device temperature</td>
<td>45 °C</td>
</tr>
</tbody>
</table>

At an ambient temperature of 80 °C and a relative humidity of 25 % the device temperature must not be below 45 °C. Otherwise condensation occurs on the lens or the electronic.
Table 3: Minimum device temperature in relation to ambient temperature and relative humidity in [°C]

Please respect the maximum ambient temperature of your measuring system!
3 Installation

3.1 Installation

The Cooling Jacket Advanced both versions can be installed in the desired position via the mounting bracket.

Figure 9: Cooling Jacket Advanced with mounting bracket (TM-JAB-TIM)

1 Mounting bracket, adjustable in two axes
3.2 Installation of TIM Camera, Infrared Video Thermometer and Infrared Thermometer

3.2.1 Assembling of the Focusing Unit

The focusing unit consists of two parts, external (1) and internal (2) part. The external part focuses the camera. The internal part fixes the camera.

**Figure 10:** Focusing unit (external and internal part)

1. External part of the focusing unit
2. Internal part of the focusing unit
Figure 11: Assembling of the $6^\circ$, $23^\circ$, $33^\circ$, $38^\circ$, $41^\circ$, $62^\circ$ and $72^\circ$ optics
Figure 12: Assembling of the 13° optics
3.2.2 Assembling of the Front Part

Figure 13: Assembling of the TIM 2xx
Figure 14: Assembling of the CTLaser, CSLaser, CTVideo, CSVideo
3.2.3 Assembling to the Cooling Jacket Advanced

Depending on the chassis either a camera of the TIM series, a laser infrared thermometer or an infrared video thermometer can be installed.

**Figure 15:** Cooling Jacket Advanced

1. Housing
2. Front part (or focusing unit)
3. Chassis
Installation of TIM camera

1. Mount the camera to the focusing unit or the front part as described in Chapter 3.2.1 respectively Chapter 3.2.2.

2. Seat the focusing unit or front part in the chassis (Figure 16). Position it as shown in Figure 17, by pushing it to the bottom.

Figure 16: Inserting of the focusing unit
Figure 17: Focusing unit with camera

3. Fix the camera with the provided screw on the bottom of the chassis.
4. Then connect the TIM camera with the provided USB cable and lead it out of the cable gland.

5. Slide the chassis with the camera in the housing. Put the pins of the hinges to the slits of the chassis and lock the hinge by pushing it forward (**Figure 19**).
Figure 19: Locking of the hinge

6. Move the locking lever to the left (symbol:_lock), so that the chassis is fitted close to the inner surface of the housing (Figure 20).
The alternate contact of the cooling jaws with the camera/infrared thermometer and inner housing generates an optimal cooling effect.

1. Contact of the cooling jaws and inner housing
2. Contact of the cooling jaws and camera/infrared thermometer
**Figure 20:** Back side of the Cooling Jacket with locking lever

1  Locking lever
7. Dismount in reverse order.

Figure 21: Unlocking of the hinge
Installation of video thermometer or infrared thermometer

1. Screw the infrared thermometer in the thread (M48x1.5) of the front part (see Figure 14) and seat the front part in the chassis (Figure 22).

Figure 22: Front part with infrared thermometer

2. Lead the sensor cable out of the cable gland.
3. Slide the chassis with the camera in the housing. Put the pins of the hinges to the slits of the chassis and lock the hinge by pushing in forward (Figure 19).

4. Move the locking lever to the left (symbol:  ), so that the chassis is fitted close to the inner surface of the housing (Figure 20)

5. Dismount in reverse order (Figure 21).
3.2.4 Assembling to the Cooling Jacket Advanced Extended

The extended version of the Cooling Jacket Advanced provides an installation of the TIM series together with the TIM NetBox and an Industrial PIF or with the USB server Gigabit and an Industrial PIF.

![Cooling Jacket Advanced, extended version](image)

**Figure 24**: Cooling Jacket Advanced, extended version

1. Housing
2. Focusing unit
3. Chassis
Installation of TIM camera

Steps 1-3, see page 33.

Figure 25: Camera implemented (extended version)

Assembling of TIM NetBox and Industrial PIF

4. Mount the holding plate (screws M3x5). Then attach the two support rods complete with the distance bolts (SW 5,5x6 - M3x6) with the provided screws (M3x10) to the bottom of the chassis. At last mount the shaft to fix the TIM NetBox (Figure 26).
Figure 26 (a-c): Mounting of the accessories for TIM NetBox: a) Holding plate for TIM NetBox (top view), b) Support rods for Industrial PIF (view from the bottom), c) Shaft to fix the TIM NetBox (view from the bottom)
5. Fix the Industrial PIF with the screws (M3x5) as shown in Figure 27.

![Figure 27: Mounting of the Industrial PIF (top view)](image)

6. To mount the TIM NetBox to the chassis screw it to the fastening rail (screws M4x8).
At first push the fastening rail with the TIM NetBox into the left notch (1) of the shaft. Afterwards into the right notch (1) (Figure 29) until it is engaged (Figure 30).

By locking the chassis the shaft pushes the TIM NetBox to the inner surface of the housing. This guarantees an optimal cooling of the TIM NetBox.
Figure 29: Notch to fix the TIM NetBox (top view)

1 Notch
7. Then connect the TIM camera and the TIM NetBox with the provided USB cable and the Industrial PIF with the camera. Combine the network connector and the TIM NetBox (Figure 31).
Figure 31: Chassis with TIM camera, Industrial PIF and TIM NetBox

Follow as step 5, page 35.
Assembling of USB server Gigabit and Industrial PIF

4. Mount the DIN rail plate with the screws (M3x5) to fix the USB server Gigabit. Then attach the support rods with the provided screws (M3x10) to one side of the chassis; use the distance ring on the left (Figure 32).

Figure 32 (a + b): Mounting of the accessories for USB server Gigabit: a) DIN rail plate for USB server Gigabit (view from the bottom), b) Support rods for Industrial PIF (right hand view)
5. Fix the Industrial PIF with the screws (M3x5) as shown in Figure 33.

![Figure 33: Mounting of the Industrial PIF (top view)](image)

6. Engage the USB server Gigabit to the DIN rail plate (Figure 34).
Figure 34 (a + b): Fitting the USB server Gigabit into the chassis (top view and right hand view)

7. Then connect the TIM camera and the USB server Gigabit with the provided USB cable and the Industrial PIF with the camera. Combine the network connector and the USB server Gigabit (Figure 35).
Figure 35: Chassis with TIM camera, Industrial PIF and USB server Gigabit

Follow as step 5, page 35.
4 Example of Installation

- TIM camera
- Cooling Jacket Advanced
- HT-Ethernet cable Cat. 6
- HT-USB cable
- PIF cable
- Industrial PIF
- 3x Analog Output
- 2x Analog Input
- 1x Digital Input

- TIM camera
- Cooling Jacket Advanced
- TIM NetBox
- USB server Gigabit
- or
Example of Installation

**Cooling Jacket Advanced Extended**
- TIM camera
- Industrial-PIF
- USB server Gigabit
- TIM NetBox
- HT-Ethernet cable Cat. 6
- PIF cable
  - 3x Analog Output
  - 2x Analog Input
  - 1x Digital Input

**CT Laser**
- HT cable
- CT Box
Cooling Jacket Advanced

CTVideo

HT cable video signal

HT cable sensor signals + laser

CT Box

CSLaser

Cooling Jacket Advanced

HT cable (analog [4-20 mA]/ digital)
Example of Installation

*All high temperature cables are available for temperatures up to 180 °C/ 250 °C:

- IR video thermometer and IR thermometer: 3 m, 8 m, 15 m
- HT-Ethernet cable Cat.6: 10 m und 20 m
- HT-USB cable: 5 m, 10 m