

# Camera FAMOS

Installation manual  
Including specifications

No. IM0973510 A 12

1/2015  
English



## Compact Camera

### Type FAMOS/FAMOS Mirror/FAMOS IR LED/ FAMOS IR LED Mirror/PAL NTSC



#### Safety

In order to guarantee safe operation, these safety instructions must be read before you start using this equipment.

- Do not open the enclosure. This can cause damage, short-circuiting or electrical shocks.
- Do not expose the equipment to extreme temperatures. This can cause deformation of the enclosure or damage to internal components.
- Repairs may only be undertaken by the manufacturer.
- The equipment must be assembled as shown in this manual.



**The minimum height of the camera must be at least 2m (+/- 0,1m) above the ground.**

**Note: Only applicable at Mirror replacement (R46).**

$\Delta$   
2m

Before you start using this equipment, please read this manual carefully and follow all instructions. We recommend that you keep this manual in a safe place for reference purposes.

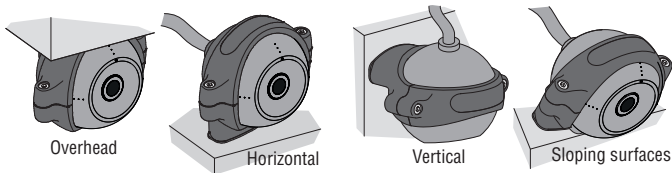
If you have any questions or issues concerning the operation of this equipment, consult the relevant section in the manual or contact the Orlaco Products BV Service department.

The camera/display systems from Orlaco comply with the latest CE, ADR, EMC and mirror-directive regulations. All products are manufactured in accordance with the ISO 9001 quality management, IATF 16949 quality automotive and ISO 14001 environmental management.

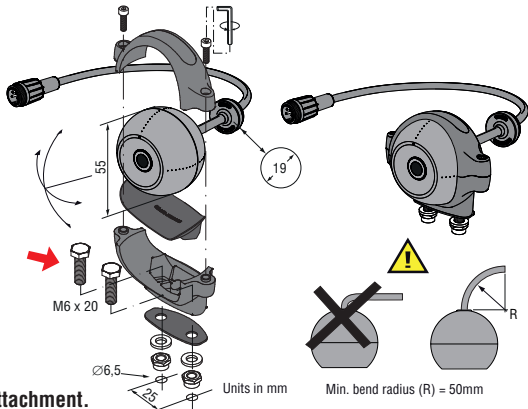


<b>Contents</b>	<b>page</b>
<b>1. Mounting and connecting Camera</b>	<b>4</b>
<b>1.1. Universal camera bracket</b>	<b>4</b>
<b>1.2. Camera attachment</b>	<b>4</b>
<b>1.3. Camera FAMOS IRLED M12 LED power off</b>	<b>5</b>
<b>1.4. Aiming the camera</b>	<b>5</b>
<b>1.5. Mounting the standard cable with molded connectors</b>	<b>6</b>
<b>1.6. Finish</b>	<b>6</b>
<b>1.7. Camera FAMOS IR LED mounting instructions</b>	<b>7</b>
<b>2. Pin connection</b>	<b>8</b>
<b>3. Description Camera</b>	<b>9</b>
<b>3.1. FAMOS</b>	<b>9</b>
<b>3.2. FAMOS Mirror</b>	<b>9</b>
<b>3.3. FAMOS Mirror SW</b>	<b>9</b>
<b>3.4. FAMOS IR LED</b>	<b>10</b>
<b>3.5. FAMOS IR LED Mirror</b>	<b>10</b>
<b>3.6. FAMOS IR LED poweroff</b>	<b>10</b>
<b>3.7. FAMOS IR LED poweron</b>	<b>10</b>
<b>3.8. FAMOS IR</b>	<b>11</b>
<b>4. Camera Specifications</b>	<b>11</b>
<b>4.1. Camera FAMOS + FAMOS IR</b>	<b>11</b>
<b>4.2. Camera FAMOS IR LED</b>	<b>12</b>
<b>4.3. FAMOS General</b>	<b>14</b>
<b>4.4. Graticule Camera FAMOS 102° PAL/NTSC Mirror SW</b>	<b>16</b>
<b>5. Maintenance and cleaning</b>	<b>16</b>
<b>6. Disposal</b>	<b>17</b>
<b>7. General terms and conditions</b>	<b>17</b>
<b>8. Revision details</b>	<b>18</b>

## 1. Mounting and connecting Camera



### 1.1. Universal camera bracket.

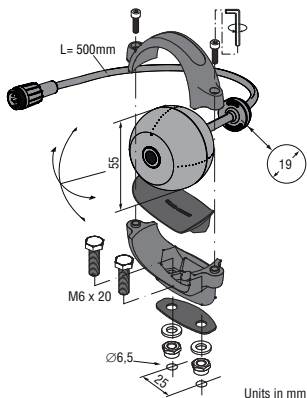


### 1.2. Camera attachment.

Recommendation:

The bracket should be tightened with a torque of 6 Nm nominal.

Tighten by hand or with very low speed.

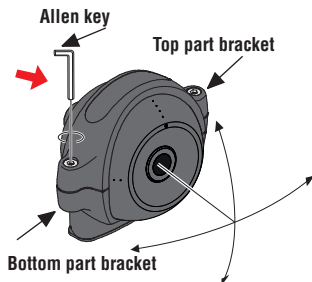


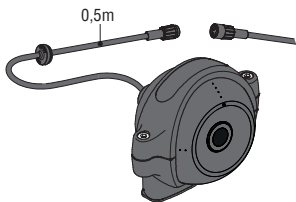
### 1.3. Camera FAMOS IRLED M12 LED power off

0,5m cable with 7p molded M16 male connector (camera power input and video output).

### 1.4. Aiming the camera.

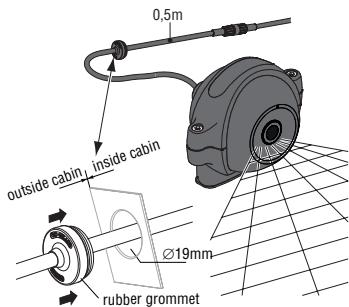
Attach the top part and bottom part of the bracket with the included M3 head cap screws and tighten with a torque of 0,8 Nm - 1Nm. Allen key included.





### 1.5. Camera with molded connectors

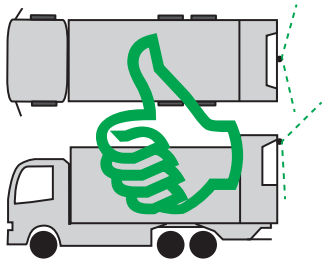
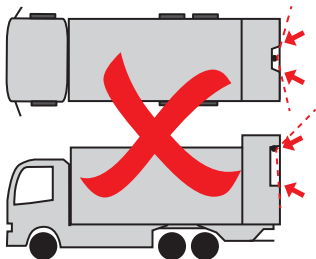
Mounting the standard cable with molded connectors.



### 1.6. Finish.

### 1.7. Camera FAMOS IR LED mounting instructions

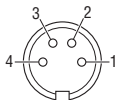
The IR LED camera is equipped with powerful LED illumination which reflects and disturbs the image if nearby structural parts of the vehicle are in the field of vision or just around the field of vision. Make sure the IR LED camera has a free area in the immediate surroundings of the camera to prevent these reflections. Warning: Infrared (IR) is emitted from this product. Do not stare directly into the camera in operation.



## 2. Pin connection

### FAMOS

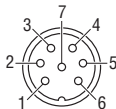
#### Front side of 4 pins male molded connector:



- 1 = Coax core
- 2 = Coax screen
- 3 = Red
- 4 = Black/orange Shielding

- = Video signal
- = Video GND
- = 12/24V/DC
- = 0V
- Connected to connector housing

#### Front side of M16 molded 7p male connector



- 1 = Coax core
- 2 = Coax Shield
- 3 = Red
- 4 = Black
- 5 = Orange
- 6 = not connected
- 7 = not connected
- Overall shield to housing

- = Video signal
- = Video shield
- = Power
- = GND
- = IR LED on/off, when connected to power\*

\* (See page 10)

Camera FAMOS IRLED poweroff or  
Camera FAMOS IRLED poweron



### 3. Description Camera

#### 3.1. FAMOS

20°/40°/60°/80°/102°/118°/129°/170° PAL/NTSC

Lens specified	Description	
	Hor. lens angle	Vert. lens angle
FAMOS 170°	170°	117°
FAMOS 129°	129°	97°
FAMOS 118°	118°	89°
FAMOS 102°	102°	72°
FAMOS 80°	80°	59°
FAMOS 60°	60°	44°
FAMOS 40°	40°	31°
FAMOS 20°	20°	15°

#### 3.2. FAMOS Mirror

102°/118°/129° PAL/NTSC

Lens specified	Description	
	Hor. lens angle	Vert. lens angle
FAMOS 129° Mirror	129°	97°
FAMOS 118° Mirror	118°	89°
FAMOS 102° Mirror	102°	72°
FAMOS 60° Mirror	60°	44°

(PAL only)

#### 3.3. FAMOS Mirror SW

118° PAL/NTSC

Lens specified	Description	
	Hor. lens angle	Vert. lens angle
FAMOS 102°	102°	72°

### **3.4. FAMOS IR LED 80°/118°PAL/NTSC**

<b>Description</b>		
<b>Lens specified</b>	<b>Hor. lens angle</b>	<b>Vert. lens angle</b>
FAMOS IR LED 118°	118°	89°
FAMOS IR LED 80°	80°	59°

### **3.5. FAMOS IR LED Mirror 118°PAL/NTSC**

<b>Description</b>		
<b>Lens specified</b>	<b>Hor. lens angle</b>	<b>Vert. lens angle</b>
FAMOS IR LED 118° Mirror	118°	89°

### **3.6.FAMOS IRLED poweroff 80°/118° PAL**

<b>Description</b>		
<b>Lens specified</b>	<b>Hor. lens angle</b>	<b>Vert. lens angle</b>
FAMOS IR LED 118°	118°	89°
FAMOS IR LED 80°	80°	59°

### **3.7.FAMOS IRLED poweron 118° PAL**

<b>Description</b>		
<b>Lens specified</b>	<b>Hor. lens angle</b>	<b>Vert. lens angle</b>
FAMOS IR LED 118°	118°	89°
FAMOS IR LED 118° Mirror	118°	89°

### **3.8. FAMOS IR 80°/118° PAL**

<b>Description</b>		
<b>Lens specified</b>	<b>Hor. lens angle</b>	<b>Vert. lens angle</b>
FAMOS IR 118°	118°	89°
FAMOS IR 80°	80°	59°
FAMOS IR 118° Mirror	118°	89°

## **4. Camera FAMOS Specifications**

### **4.1 Camera FAMOS + FAMOS IR**

#### **Sensor**

#### **Video signal:**

PAL = 720(H)x576(V) 50fld/s. NTSC = 720(H)x480(V) 60fld/s. 1 Vtt composite video into 75 Ohm.

#### **Sensor element:**

1/4" CMOS digital image sensor. 640 H x 480 V.

#### **Light sensitivity:**

<0,05 Lux.

#### **Dynamic Range:**

80dB.

#### **Electrical**

#### **Power input:**

12...24V/DC. Below 6V: camera is non functional. Between 7V heating element automatically activated (20% capacity). At 8V the camera is fully functional and the heating is at 40% of its capacity. At 12V the heating is at 100% capacity. Between 12V and 33V camera and heating element are fully functional. Above 33V the overvoltage protection is activated and camera plus heating element are switched off. This overvoltage-protection is deactivated below 32V. Power

Circuit is protected up to 80V/Dc. Outputs are Short Circuit Protected.

*In all these above mentioned values; a tolerance of +/-10% is applied.*

### **Power consumption:**

Heating off: 1.1W at 12V, 1.2W at 24V;

Heating on: Max. power at 24V  $0,15A = 3,6W$ . Max. power at 12V  $0.28A = 3.4W$ .

### **Inrush current:**

0.5A at 12V and 1.0 A at 24V ( $t < 2ms$ , peak ( $>90\%$ )  $t = 0.3ms$ ).

### **Heater element:**

2.4W max. Pulse width modulated, activated from  $+30^{\circ}C$  (min) to  $-40^{\circ}C$ .

### **Transient protection:**

Camera may be powered directly from 12V or 24V battery without additional electrical protection since camera has an integrated circuit that protects the camera against over- and undervoltage, spikes, ripples and load dumps.

### **Connectors:**

0,5m cable with 4p molded male connector (camera power input and video output).

### **Min. cable bend radius:**

50mm.

## **4.2 Camera FAMOS IR LED**

### **Sensor**

#### **Video signal**

PAL = 720(H)x576(V) 50fld/s. NTSC = 720(H)x480(V) 60fld/s. 1 Vtt composite video into 75 Ohm.

#### **Sensor element**

1/4" CMOS digital image sensor. 640 H x 480 V.

#### **Light sensitivity**

$<0,05$  Lux. The IR camera also provides a good image with 0 lux ambient light by means of the IR LEDs.

### LED

4 High Power Infrared LEDs (850nm).

#### Activation IR LED's

Modern software algorithm measures automatically the output parameters of the CMOS sensor and automatically decides and activates the value of IR illumination needed for the best image. IR LED's are activated between 0% and 100% in steps of 1%.

### Electrical

#### Power input:

12...24V/DC. Below 12V: camera is non functional. At 12V the heating and IR LED are available at 100% capacity. Between 12V and 33V camera, heating element and IR LED are fully functional. Above 33V the overvoltage protection is activated and camera plus heating element and IR LED are switched off. This overvoltage-protection is deactivated below 32V. Powercircuit is protected up to 80V/Dc. Outputs are Short Circuit Protected. *In all these above mentioned values; a tolerance of +/-10% is applied.*

#### Power consumption:

Camera only: 1.2W at 12V , Heater & full LED on: 7,5W at 12V

Camera only: 1.2W at 24V , Heater & full LED on: 7,5W at 24V

#### Inrush current:

0.5A at 12V and 1.0 A at 24V ( $t < 2\text{ms}$ , peak ( $>90\%$ )  $t = 0.3\text{ms}$ ).

#### Heater element:

2.4W max. Pulse width modulated, activated from +30°C (min) to -40°C.

#### Transient protection:

Camera may be powered directly from 12V or 24V battery without additional electrical protection since camera has an integrated circuit that protects the camera against over- and undervoltage, spikes, ripples and loaddumps.

### Connectors:

- **IRLED:** 0,5m cable with 4p molded male connector (camera power input and video output).
- **IRLED power off/poweron:** 0,5m cable with 7p molded M16 male connector (camera power input and video output).

### Min. cable bend radius:

50mm.

## 4.3. FAMOS General

### Mechanical

#### Housing:

Cyclopol (PC + ABS). Filling: Camera is potted with Polyurethane elastomer.

#### Ingress protection:

IP67 according to IEC 60529; dust tight and protected against the effects of continuous immersion in water up to 1m under water for 30 minutes. IP69K according to DIN 40050-9: camera can withstand a high pressure cleaning with water: 14-16L/min. 80°C and 100 bars flow.

#### Mounting hardware:

Standard stainless steel.

#### Shock constancy:

Shock and vibration resistant for usage on trucks, cranes, fork-lifts, maritime applications, machinery. Random vibration test 15,3Grms at frequency: 24 to 2000, PSD ( $\text{g}^2/\text{Hz}$ ) 0,04 to 0,10.

#### Camera bracket:

Material: glass reinforced polyamide, test: 50 Nm at -40°C to +85°C.

#### Weight:

0,21kg, 0,29 in standard packing.

### **Truck use:**

Withstand all fluids and materials used in and around trucks like: ammonia solution 5%, ethanol 80-100%, isopropanol 5-10%, soapy water (min. 50% soap per volume), alkaline degreasing compounds(used in high pressure washing equipment).

### **Operating temperature:**

Camera; -40°C to +85°C.      IRLEDs; -40°C to +50°C.

### **Storage temperature:**

-40°C to +100°C.

## **Certification**

### **Approvals:**

Approvals in compliance with all relevant EMC- and Automotive directives. This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Certificates available upon request.

### **Green Passport:**

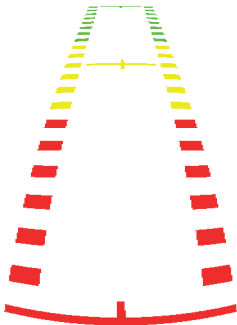
All materials are compliant to Green Passport requirements according IMO resolution MEPC.197(62) as adopted on 15 July 2011 (Maritime sector: International Maritime Organization concerning the functions of the Marine Environment Protection Committee).

## Graticule

### 4.4. Camera FAMOS 102° PAL/NTSC Mirror SW

The setting of this camera includes a graticule. The graticule is designed to match with the opening angle of this camera.

The graticule is made for a vehicle with a width of 2.75m and the length that is covered by the graticule is 10m. During installation the camera should be aimed right to match the displayed image with the graticule. Example of the displayed graticule in the picture.



## 5. Maintenance and cleaning

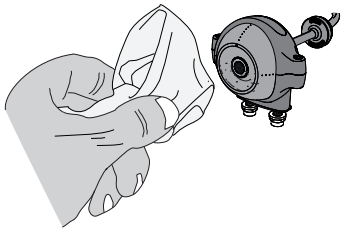
Fixing a blurry image:

If the camera image is blurry, it is advisable to clean the camera.

### Cleaning the lens glass:

Use a soft cloth to clean the lens glass of the camera. Use clean water or a high quality and safe foam cleaner. Rub the camera lens glass clean with the cloth.

Do absolutely not use aggressive chemicals or abrasive cleaning agents.





## 6. Disposal

Disassembly, removal and disposal. Local regulations for dealing with waste must be followed when disposing of disassembled components or entire units.

## 7. General terms and conditions

Orlaco Products BV is not liable for damage resulting from inadequate servicing, incorrect usage or alterations made to the equipment without informing the manufacturer in writing.

This installation manual has been made available by Orlaco Products BV.

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Orlaco reserves the right to make changes to components at any time without informing customers beforehand or directly. All dimensions given are for commercial purposes.

For information regarding repairs that is not covered in this manual, please contact the Orlaco Products BV service department.

This manual has been prepared with all due care and attention. However, Orlaco Products BV cannot be held responsible for any errors in this manual or any consequences thereof.

## 8. Revision details

**R1-0.** First issue, January 2015.

**R1-1.** Specifications changed, page 8, February 2015.

**R1-2.** Camera lenses(page 8) and Friction pad added(page 4), October 2015.

**R1-3.** IRLED added, February 2016.

**R1-4.** Text pin layout changed, chapter 2, March 2016.

**R1-5.** Storage temperature changed, May 2016.

**R1-6.** Mirror and IRLED versions added, September 2016.

**R1-7.** Connector IRLED LED\_power off changed, October 2016.

**A 01.** Camera FAMOS 129° PAL Mirror added, November 2016.

**A 02.** Camera FAMOS 60° PAL Mirror added, December 2016.

**A 03.** Vertical lens camera angle 170 ° changed, March 2017.

**A 04.** Specifications Heater element changed, March 2017.

**A 05.** Chapter 1.7. added, November 2017.

**A 06.** Specifications changed: Ingress protection, page 14, February 2018.

**A 07.** Text added (R46) at page 2, July 2018.

**A 08.** Camera FAMOS IR added, November 2018.

**A 09.** Camera FAMOS IR LED poweron added, January 2019.

**A 10.** Operating temperature IRLED changed, January 2019.

**A 11.** Inrush current changed, July 2019.

**A 12.** Specifications IR LED changed, June 2020.



Orlaco is a Manufacturing company that specializes in making cameras and monitor systems for commercial vehicles, fork-lift trucks, cranes, off shore and maritime. Our objective is to design and produce camera systems for the professional market that improve the drivers' view and increase operating efficiency.

At our facility in Barneveld we locate our design, manufacturing, warehousing and service department. Vision is our mission®. Orlaco therefore deploys the development, manufacture, supply and service of camera and display systems that will improve safety and efficiency of all vehicles, machinery and vessels. Our systems give the end user a view on each blind spot and will create comfort and improved working conditions. Our active approach will support market demands and innovations and will lead to enthusiastic ambassadors in the market; our customers.

For more information: [www.orlaco.com](http://www.orlaco.com)

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