

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

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Camera FAMOS

Installation manual
Including specifications
No. IM0973510 R1-2

1/2015
English



Compact Camera Type FAMOS 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.

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, ISO/TS16949 quality automotive and ISO 14001 environmental management.



5. Disposal

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

6. 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. All rights reserved. No part of this manual may be reproduced and/or made public in printed form, in photocopy form or on microfilm, or in any other way, without the prior written permission of Orlaco. This also applies to the associated drawings and figures.

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.

7. 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.

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).

4. Maintenance and cleaning

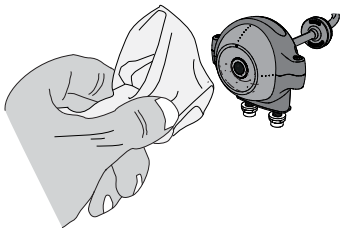
Fixing a blurry image:

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.

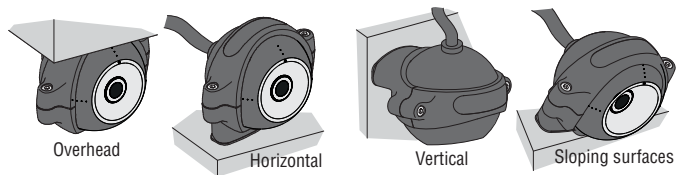
Do absolutely not use aggressive chemicals or abrasive cleaning agents.



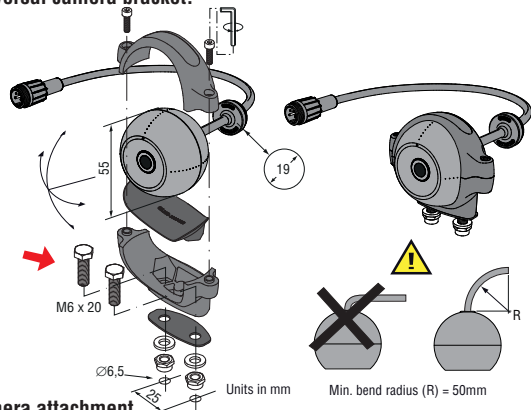
Contents

	page
1. Mounting and connecting Camera	4
1.1. Universal camera bracket	4
1.2. Camera attachment	4
1.3. Aiming the camera	5
1.4. Mounting the standard cable with molded connectors	5
1.5. Finish	6
2. Pin connection	6
3. Specifications	7
4. Maintenance and cleaning	10
5. Disposal	11
6. General terms and conditions	11
7. Revision details	11

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.

Mechanical

Housing:

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

Ingress protection:

IP68 according to IEC 60529; dust tight and protected against the effects of continuous immersion in water up to 10m 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 (g^2/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:

-40°C to +85°C.

Storage temperature:

-40°C to +125°C.

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:

At 12V: 4.5A, 300us. At 24V: 12.0A, 300us.

Heater element:

2.4W max.

Transient protection:

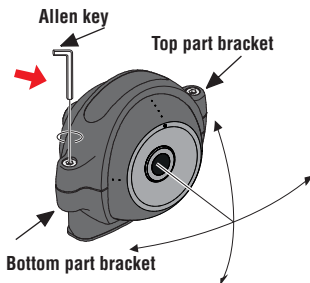
Camera may be powered directly from 12V or 24V battery without additional electrical protection since camera has an integrated circuit that protects the camera against over- and undervoltage, spikes, ripples and load dumps.

Connectors:

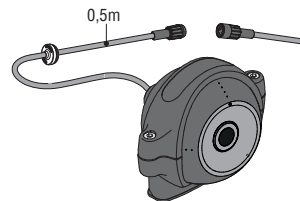
0,5m cable with 4p molded male connector (camera power input and video output).

Min. cable bend radius:

50mm.

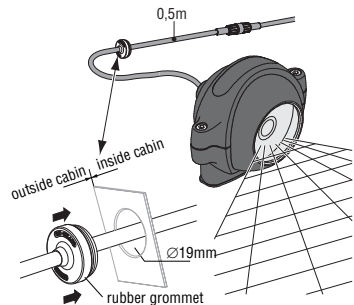
**1.3. Aiming the camera.**

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.

**1.4. Camera with molded connectors**

Mounting the standard cable with molded connectors.

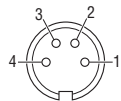
1.5. Finish.



2. Pin connection

FAMOS

Front side of 4 pins male molded connector:



- 1 = Coax core (Video signal)
- 2 = Coax screen (Video GND)
- 3 = Red (12/24V/DC)
- 4 = White (0V)

Connected to Connector housing and Camera housing

3. Specifications Camera FAMOS

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

Description

Lens specified	Hor. lens angle	Vert. lens angle
FAMOS 170°	170°	127°
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°

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.