

# **viasys Video Alarmsystem for PV Plants**

## **Detailed engineering**

**PV Protection system based on viasys intelligent Video Analysis**



Rev. 1.4, April 2012

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## Purpose of this document:

The purpose of this document is to describe the detail engineering concept behind the Security solution for the PV plants.

After a general description of the system, the structure in a block diagram will be shown. Attached are also drawings of the poles and the foundations as well as the data sheets of the components of the system (all drawings will be provided as dwg).

## General description of the Security System

The security system is based on the **viasys Active Intrusion Detection System**.

This system uses video- and thermal cameras (CCTV) disposed along the fence of the PV area to defend as videor sensors.

The evaluation of the images in order to obtain reliable alarms indications is called "Intelligent Video Analysis". In other words using the "intelligent video analysis" feature of the Via:Sys Software on the images coming from the cameras along the fence, reliable detection of relevant alarm conditions will be made. Therewith no additional physical sensors are required (microwave, fencesensor, IR barriers, etc ) and are only optionally integrated on request.

The architecture of the active CCTV system is based on the following parts:

- **CCTV Cameras** disposed along the fence incl. poles and IR illumination
- **Thermal cameras** disposed along the fence incl. poles
- **The local cabling infrastructure** (video and power)
- **The video analytics/recording subsystem** inside climatized rack in special cabinet or outdoor housing
- **The central software management system** located in the Central control room of the PV plant
- **The communication infrastructure** from the PV field to the Monitoring service centre
- **The monitoring service centre** handling the alarms acc. to the agreed intervention plan

## ***CCTV Cameras/ Thermal Imaging Cameras***

- Fixed day/night cameras with high IR sensitivity (hardware switching IR filter), high dynamic range and high night contrast w low noise.
- are connected to the central analytics subsystem / recording subsystem via copper cable
- no active amplifier or transceiver is used on the camera side (pole)
- the camera housing is metallic (no plastic housings), with anti-condensation heating
- the cabling entering the camera housing are completely buried in the foot of the camera in order to avoid tampering and sabotage
- the pole is 4.30m out of ground, with inspection door and installation of fuse box to which connect the camera, enclosure and IR flood light
- each CCTV pole will have an IR floodlight LED illumination system able to give in condition of darkness, pictures of good quality for the analytics subsystem to work properly
- each Thermal CCTV pole needs power and signal transmission infrastructure, but no IR floodlight LED illumination
- poles with thermal imaging cameras will not have IR floodlights
- The cameras are positioned along the fence in order to guarantee that there are no blind spots and the ability to detect alarm conditions and relevant movements for the video analytics subsystem (no dark angels). In addition the cameras control each other in order to detect tampering attempts.

### **A typical camera sample and housing:**

- 1/3" Super HAD Color/B&W CCD Sensor
- High and Low Speed Shutter Control (MES/ESC/DSS)
- Horizontal Resolution of 540 TV Lines
- Active picture elements 440.000, 752 (H) x 582 (V)
- On-screen Menu Control / Camera Title Display
- Sensitivity of 0.17Lux at F1.2 (Color, AGC ON)
- Privacy Masking/Mirror Function/Motion Detection
- Digital Noise Reduction (DNR) - Picture Sharpness and Flicker less Adjustment
- Selectable Gain Control (AGC) - Auto Iris and DC Iris Control
- Selectable Backlight Compensation Zones (BLC)



Thermal CCTV Camera outdoor housing



## ***IR illumination***

- Spectral Emission: 850nm / Beam Angle: 50°
- Low Self-heating / Vibration-resistant
- 292 LEDs with Narrow-band Light Emission
- Extended Temperature Range Components included
- Sensor Controlled Twilight Switch w. IR Cut Filter
- Natural-coloured anodized Aluminium Casing
- Integral Switching Power Supply with Softstart
- Clear Plastic Cover
- Power Supply: 200 to 240VAC, 50Hz
- Protection Rating: IP66
- Efficiency Factor: 97% (cos Phi >0.9)
- Option: Fastening, Wall and Ceiling Mount Brackets



## ***Poles***

- Masts must be put up vibration-free in a solid concrete foundation. The supplier requires the following for the foundation: 0,5x0,5x0,7 meters min. (depends on soil condition), a protective conduit must be laid in the foundation for cable entry (50mm min.).
- The mast's maintenance door must face the solar farm (inwards).
- In the case that masts will be moved at some point, a plastic pipe (Diam. = 250 mm max., L = 900 max.) can be encased in the concrete to fit the mast. The gap (mast to pipe) is filled with basalt grit or siliceous sand. To achieve higher stability at the top of the mast, the foundation must be sealed with a layer of concrete (app. 100 mm).
- Mast height above ground: 4300 mm, total mast length: 5000 mm (see enclosed drawing).



## The local cabling infrastructure

The cabling infrastructure consist of copper video cables and the power cable. The cables including the trenches will be **completely independent from the cabling of the PV-plant**. That means that the cabling only follows the fence line.

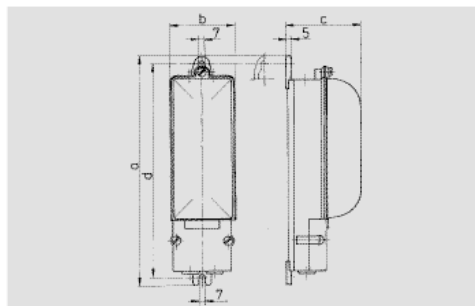
The six rack with the servers are also located near the fence in special outdoor housing or small cabinets, close to the inverter houses and therewith connected to the site infrastructure (power and IP-network). For more details please refer to the attached drawing. The final details of the cabling will be defined during the project processing and part of the project documentation.

Specification of the **video cable** is

- coaxial underground cable 75 100 V (1,0/6,6) - 75 Ohm PE up to 450m
- 2-wire video cable A-2Y L 2Y2x2x0,6 or 0,8mm underground cable from 450 m and up
- The video cable is always laid in one piece
- Video cables must be kept in sufficient distance to any medium voltage wire, transformers or other sources of interference. Shielding has to be provided if required.

Specification of the **power cabling**

- For safety, in the case of malfunction, we recommend every second mast to be powered with each power line. Wiring therefore will provide at least two separate circuits with separate RCCB/RCDs to ensure that only every second mast is affected if one circuit disabled. To every circuit, a maximum of 10 cameras should be connected.
- The maximum power input at night is 98 W per mast. We recommend 2-pole RCDs with 500 mA. 2-A-fuses for camera and IR-emitter should be connected upstream in each mast to avoid short circuit.
- Transfer Point (mast) 230V: In the inspection door of each mast a fuse box will be installed (Mennekes order no. 10896, fuse-base 2xD 01 (E14) and fuse fixtures & fittings (DIN 43628) 2 x Neozed D 01, 2 Ampere).



|             |          |   |   |
|-------------|----------|---|---|
| Bestell-Nr. | 10896    |   |   |
| Maße in mm  | a        | b | c |
|             | d        | e | f |
|             | g        | h | i |
|             | j        | k | l |
|             | m        | n | o |
|             | p        | q | r |
|             | s        | t | u |
|             | v        | w | x |
|             | y        | z |   |
| Zeichnung   | 8 MB 119 |   |   |

## ***The video analytics and recording subsystem***

- The video analytics subsystem is the heart of the Security System.

It analyzes 2fps for each connected camera in order to detect relevant movements and based on advanced filtering software features permits to optimize the false alarm generation.

- The analytics/recording subsystem consists mainly of an industrial grade linux based PC located in a central rack connected to the deployed cameras. In the Rack other units are located as described later.
- The system is Modular. The typical number of cameras connected to each analytics/recording subsystem is of 16 or 32. Therefore in bigger projects like this one, where more than 16/32 cams are used, the viasys System can be seen as completely **modular**.

In other words each group of 16/32 cameras are treated as a subsystem that is infrastructurally independent from the others. This approach gives the ability to simplify greatly the design of the cablings and infrastructures needed. Each single module is then integrated as one system at the software level with the monitoring client.

- Each central unit rack is able to handle the simultaneous analytics on every camera, no additional hardware for the analytics is required.
- for each camera the analytics subsystem elaborates in realtime the images for detection of relevant movements. Detected movements are handled internally with parameters that can be set individually for each camera and are filtered with the following criteria:
  - o For each single camera the size of the moving object is filtered and weighed according to the three dimensional perspective (3D motion detection)
  - o natural repetitive movements (like trees in wind, grass, clouds shadows) are filtered out
  - o conditions of camera coverage are detected by the analytics subsystem and generate immediate alarm
  - o conditions of missing camera signal are detected by the analytics subsystem and generate immediate alarm
  - o conditions of glaring from strong lights are detected by the analytics subsystem in order to be filtered out
  - o Remaining relevant movements are filtered by the analytics of several pictures / accumulation of several alarms in order to minimize further false alarms conditions.
  - o Every alarm picture when stored and sent to the monitoring centre is marked with a clear detection frame highlighting the object that caused the alarm

- The central system can record on internal mass storage each picture that resulted in an alarm condition. It is possible to record also pre-alarm conditions and continuous recording
- After the filtering process, the alarm indications are automatically transmitted to a "central station software" that is integrated and is part of the whole architecture.
- the system architecture is able to fully integrate towards the unique 'central software management system' every further alarm signal coming from other optional sensors based on on/off contacts.
- The video analytics/recording subsystem will be placed in a closed rack with:
  - o active climatisation of the rack with remote indication of internal temperature to the central management software
  - o UPS protection and filtering with at least 15min of battery time life
  - o No proprietary hardware units
  - o immediate indication to the central management software of condition of lack of power
  - o the rack will have power control appliance that permits to remotely control and switch 8 power supply sockets inside the rack
  - o each rack is provided with digital input / output unit has full integration within the 'central management software'. This I/O unit will permit to the remote operator to switch through 'relays' any kind of load on the field (emergency lights, door opener, siren etc) and will permit to integrate in the 'central management software' indications coming from any kind of sensor that has on/off output contacts (only as example badge readers, fire/smoke alarm systems, flooding sensors, ...)
  - o Each rack will be delivered with a standard of 4 digital input lines and 4 digital output lines and is upgradable with 32 input lines and 32 output lines in total.

### ***Rack / cabinet***

The six rack with the servers are also located near the fence in special outdoor housing or small cabinets, close to the inverter houses and therewith connected to the power and IP-network. For more details please refer to the attached drawing.



- The viasys system cabinet requires a separate electricity circuit with a 10 A-fuse. **Transfer** point is a socket to be provided and installed by the customer within the cabinet. The cabinet must be earthed via the earth circuit connector. Video cables will be placed in the cabinet. They will be labelled and provided in sufficient length. The voltage required (230 V) must be supplied to the system cabinet **before** the viasys components are installed.
- Room temperature should ideally be at 25° C but not more than 30° C. Air conditioning of the system room has to be provided if necessary and must be fuse-protected (with separate RCD if required by local regulations).
- The customer must provide the router and a CAT-5 network cable must be laid from the router to the 19" viasys cabinet.

### ***The central software management system:***

- is located in the central control room of the PV-plant
- is able to monitor the Intrusion Detection Systems of several subsystem modules.
- equipped with several monitors to have parallel live view of all relevant cameras
- is based on a user friendly interface, with a single user interface approach for all aspects (incoming alarms, connection activated with no alarm by operator, searching and viewing of recorded events, management of incoming signals and outgoing switching commands of the I/O lines)

### ***The monitoring service centre***

- is able to monitor the Intrusion Detection Systems of several subsystem modules.
- delivers to the operator clear real time indication of alarm conditions on field. These indications will have clear picture with the highlighting of the object / objects (detection frame) that caused the analytics system to enter the 'alarm' status, with indication of which field / camera caused the alarm
- Is based on a user friendly interface, with a single user interface approach for all aspects (incoming alarms, connection activated with no alarm by operator, searching and viewing of recorded events, management of incoming signals and outgoing switching commands of the I/O lines)
- has bidirectional communication, thus the monitoring centre has access to live and stored alarm images in the PV site
- will record all kind of activities made by the operator in a logfile
- will automatically control the proper functionality of the subsystems in the plants e.g. with routine calls, automatically generating an alarm in case of a failure



## ***Communication infrastructure***

The local infrastructure in the field is based on the IP-network which permits to operate the central management software from one central control room and connect all the recording/analysis systems placed on field.

The IP infrastructure is out of the scope of this paper and will be made available from the customer, together with the power supply, at each rack/cabinet point.

At each rack/cabinet where a central recording and monitoring subsystem is placed the network must be delivered with a dedicated Ethernet 100baseT interface.

The customer can choose freely to connect each of these Ethernet delivery points to the central monitoring station as follows:

Option 1) via a Layer 1 optical network that delivers all Ethernet delivery points in the central control room

Option 2) via a Layer 2 network where all Ethernet delivery point are in a switched VLAN

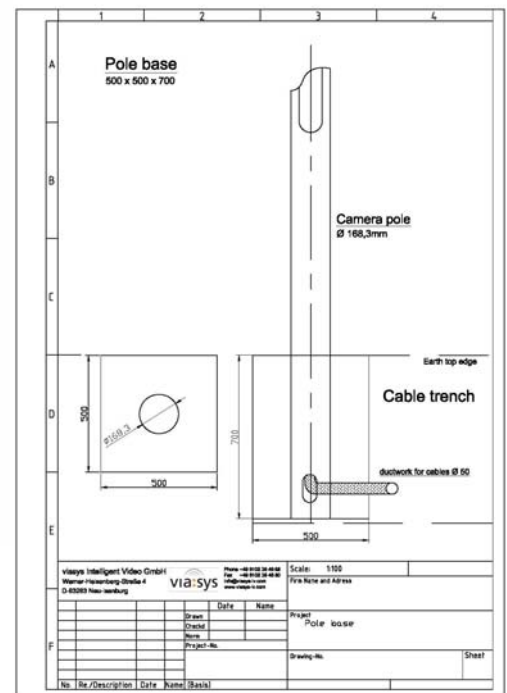
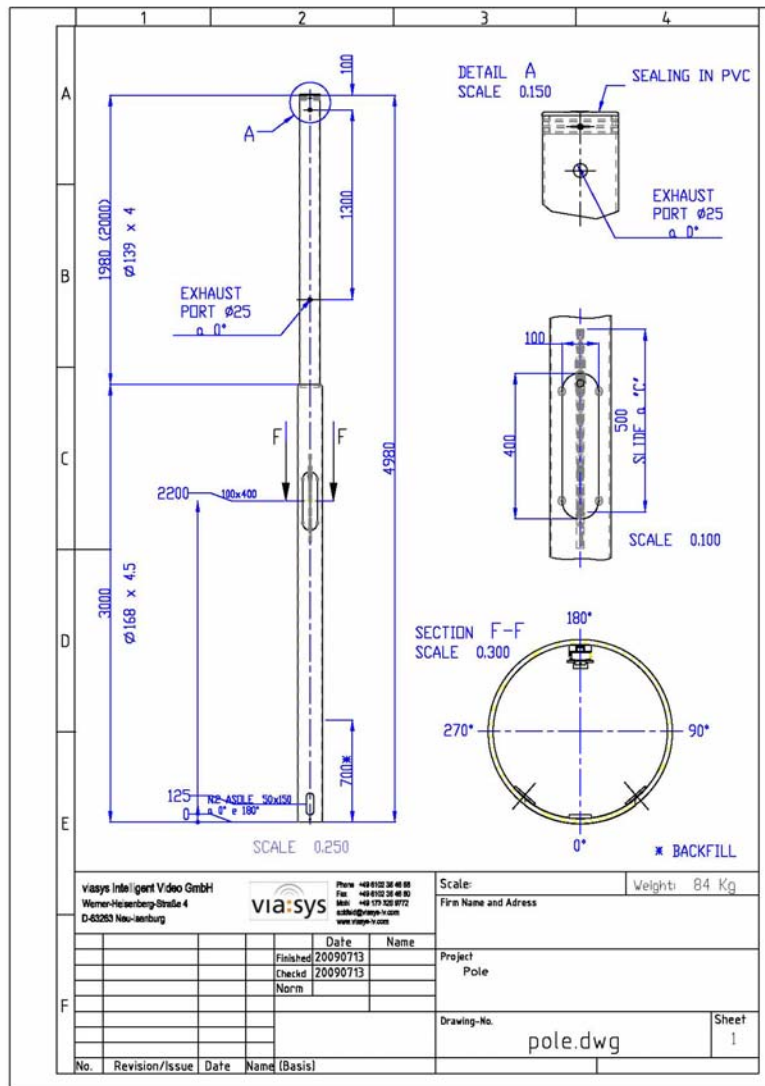
Option 3) via Layer 3 networking, where at each delivery point are reserved at least 6 IP hosts addresses and all are reachable from the central control room IP.

The communication towards the remote monitoring service center will also be delivered by the customer. We suggest to connect using HDLSL line, and strongly advise to have at least one routed backup communication link (for example via VSAT bidirectional satellite connection).

In any case the connection must have **at least 256 kbps upload speed and a public and static IP addresses** range for at least 6 Hosts.

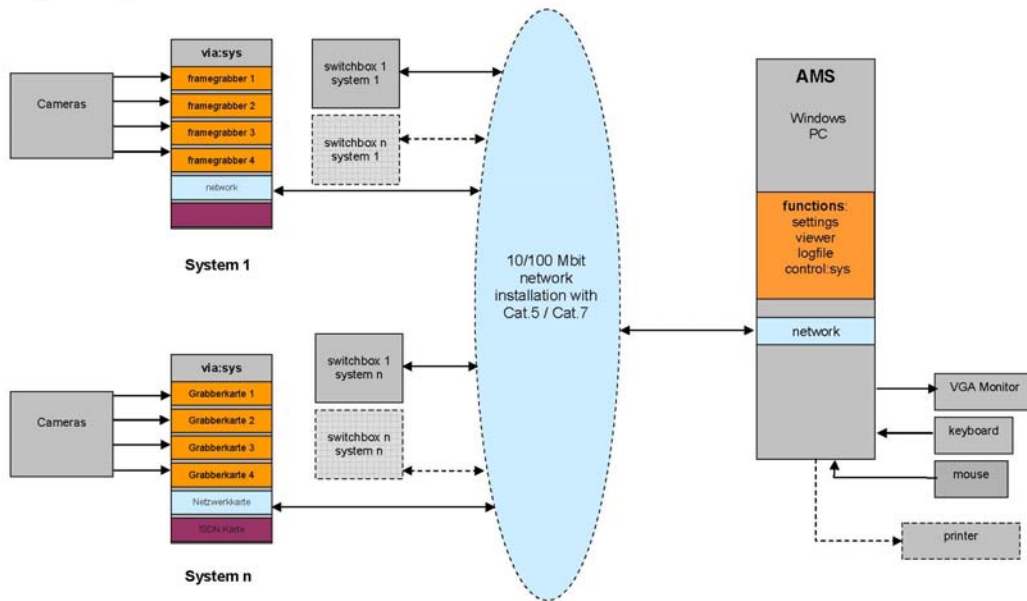
## Drawings

### The complete pole (incl. foundation)

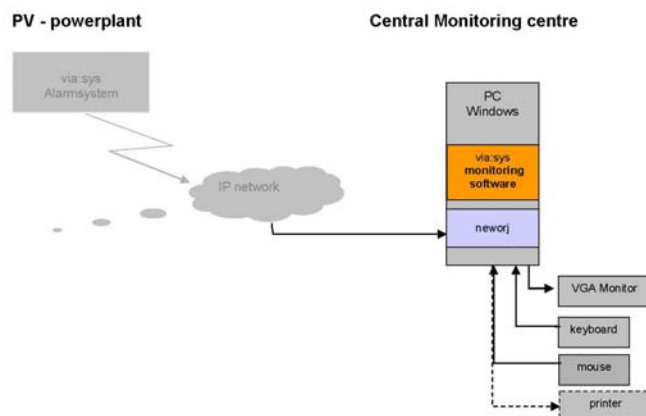


## Block schematic of the system

Alarm-Managementsystem AMS



Central monitoring centre



The final layout with the single line diagrams, control diagrams etc. will be defined during the project processing and part of the project documentation.

## ***Datasheets***

- Camera
- Thermal camera
- Lens
- Housing
- Video-Cable
- IR- spotlight
- Surveillance camera
- Rack / Cabinet

# SHC-737P

Home | Security | Cameras | »> Cameras (discontinued)

SHC-737P

1/3" Day&Night Camera, SSNR II, HLC, DIS, 580TVL,

12VDC/24VAC

Art-Nr. 97028



Lens not included

## Main Features

1/3" Vertical double density color CCD  
SV-IV (the latest generation of SV DSP engine)  
SSNR II (upgraded Noise Reduction technology)  
Day & night with ICR (infrared cutfilter removal)  
Image Resolution of 580TVL(Color), 700TVL(B/W)  
Min. illum.: 0.05Lux@F1.2(Color), 0.0025Lux(B/W)

Privacy masking with 8 programmable zones  
HLC (Highlight Compensation)  
DIS (Digital Image Stabilization)  
Intelligent MD : 8 zones  
RS-485 remote setup control  
OSD (On Screen Display)

## Specifications

|                                   |                                                      |
|-----------------------------------|------------------------------------------------------|
| System                            | day&night                                            |
| Sensor size                       | 1/3"                                                 |
| Imager                            | CCD                                                  |
| Horizontal resolution             | 580 TVL                                              |
| Sensitivity (at 50% video signal) | 0,05 Lux, at F1.2 (colour); 0.0025 Lux at F1.2 (B&W) |
| Low speed shutter                 | yes                                                  |
| Digital Noise Reduction (DNR)     | yes                                                  |
| Backlight compensation            | BLC, HLC                                             |
| Wide Dynamic Range (WDR)          | no                                                   |
| IR cut filter                     | switchable                                           |
| Lens mount                        | CS/C mount                                           |

# SHC-737P

(Continuation Spezifications)

|                          |                  |
|--------------------------|------------------|
| <b>Video outputs</b>     | composite (CVBS) |
| <b>Serial interfaces</b> | RS-485           |
| <b>Supply voltage</b>    | 24VAC, 12VDC     |
| <b>Certificates</b>      | CE               |

## Optional accessories

|        |           |                                    |
|--------|-----------|------------------------------------|
| 120063 | STB-4150V | Wall Mount Camera Bracket, indoors |
|--------|-----------|------------------------------------|



**VIDEOR**

# YV10X5HR4A-SA2L

Home | Security | Lenses | Varifocal

YV10X5HR4A-SA2L

F1,6/5-50mm Megapixel DC Lens, 1/3", Varifocal,

No Focus Shift, CS Mount

Art-Nr. 45251



**FUJINON**  
FUJIFILM

## Main Features

Suitable for 1/3" and 1/4" colour and b&w cameras  
No-focus-shift from visible to near IR light range  
Variable focal length  
Aspherical lens elements

CS mount  
High standard of optical and mechanical quality  
Without built-in auto iris amplifier  
With 4-pin connector

## Specifications

|                               |                     |
|-------------------------------|---------------------|
| Lens type                     | varifocal           |
| Application range             | security, day/night |
| Day/Night                     | yes                 |
| Megapixel                     | yes                 |
| Aspherical technology         | yes                 |
| Nominal format size           | 1/3"                |
| Flange focal length           | 12.5mm              |
| Mount                         | CS                  |
| Focal length                  | 5 mm - 50 mm        |
| Horizontal angle of view      | 51,3° - 5,5°        |
| MOD (Minimum object distance) | 0,3 m               |
| Aperture range (F)            | F1.6~F360           |
| Iris control                  | DC                  |
| Screw-in depth                | 5.0mm               |
| Filter screw size             | not available       |

## YV10X5HR4A-SA2L

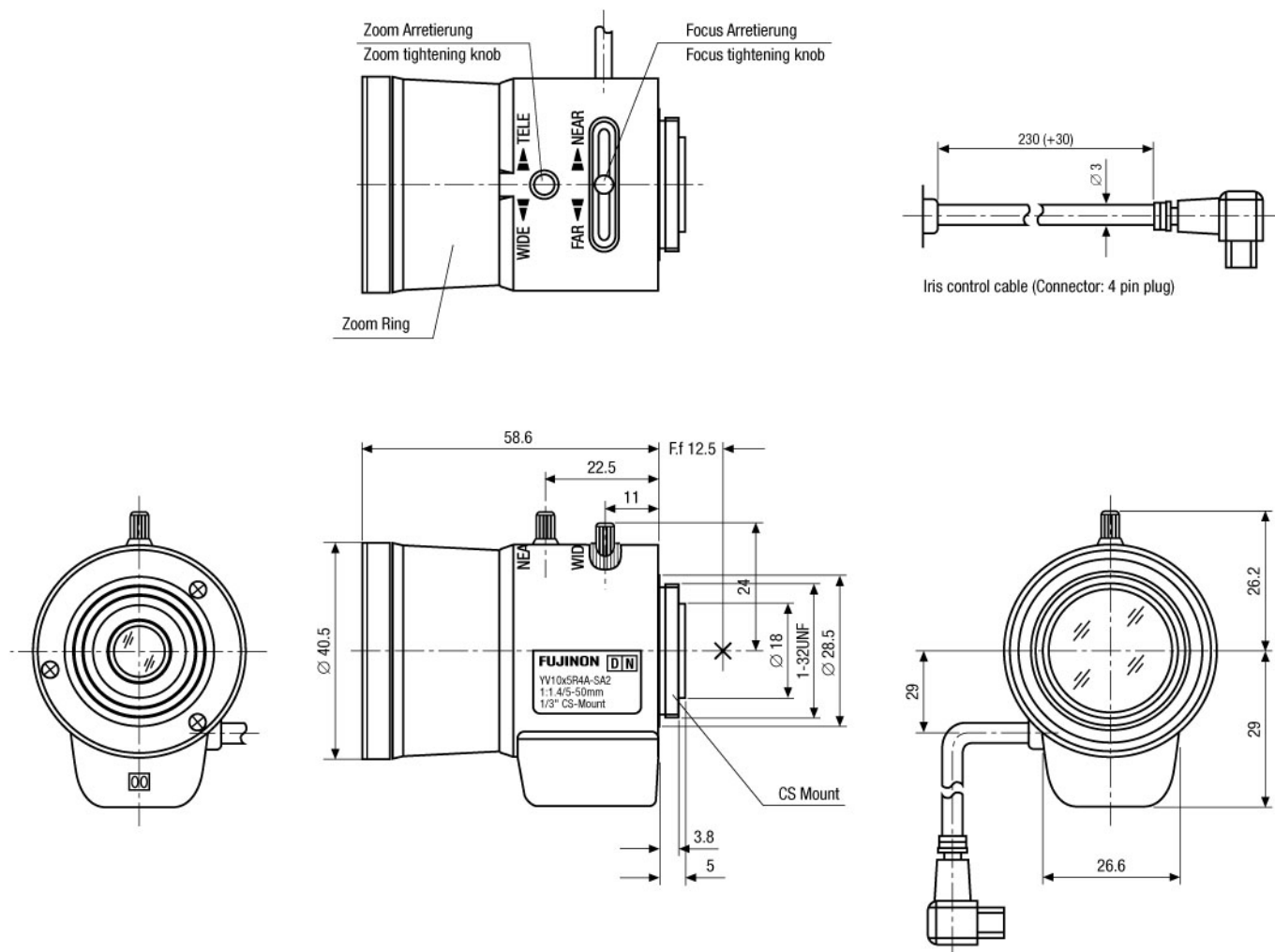
(Continuation Spezifications)

|                                      |              |
|--------------------------------------|--------------|
| <b>Cable length</b>                  | approx. 23cm |
| <b>4-pin plug</b>                    | Standard     |
| <b>Temperature range (operation)</b> | -10°C ~+50°C |
| <b>Length</b>                        | 85,6 mm      |
| <b>Diameter</b>                      | 40,5 mm      |
| <b>Radius</b>                        | 29 mm        |
| <b>Dimensions (LxDxH)</b>            | See drawing  |
| <b>Weight</b>                        | 85g          |

# YV10X5HR4A-SA2L

Home | Security | Lenses | Varifocal

## Technical drawing



Maße/Dimensions: mm



**VIDEOR**

# VTL-WWA

Home | Security | Housings | for Boxed Cameras

VTL-WWA

Weatherproof Housing (300mm) with Heater Thermostat,

Wallbracket, RAL9002, 230VAC

**Art-Nr. 79488**



## Main Features

Weather protection for cameras

Integrated wall bracket

Fold-down housing body

Insulated camera mounting

Housing body length: 300mm

Cable entry through the wall bracket

230V window heater included

Protection rating: IP66

Housing colour: RAL9002

## Specifications

|                             |                          |
|-----------------------------|--------------------------|
| Series                      | eneo VTL                 |
| Maximum installation length | 300                      |
| Clear Shield                | no                       |
| Window heater               | yes, 100~240V/40W (PTC)  |
| Blower                      | optional                 |
| Wiper                       | no                       |
| Supply voltage              | 100~240VAC               |
| Sunshield                   | yes                      |
| Hidden cable management     | yes                      |
| Cable entry                 | Through the wall bracket |
| Integrated wall mount       | yes                      |
| Protection rating           | IP66                     |
| Housing                     | outdoor                  |
| Housing material            | aluminium                |

# VTL-WWA

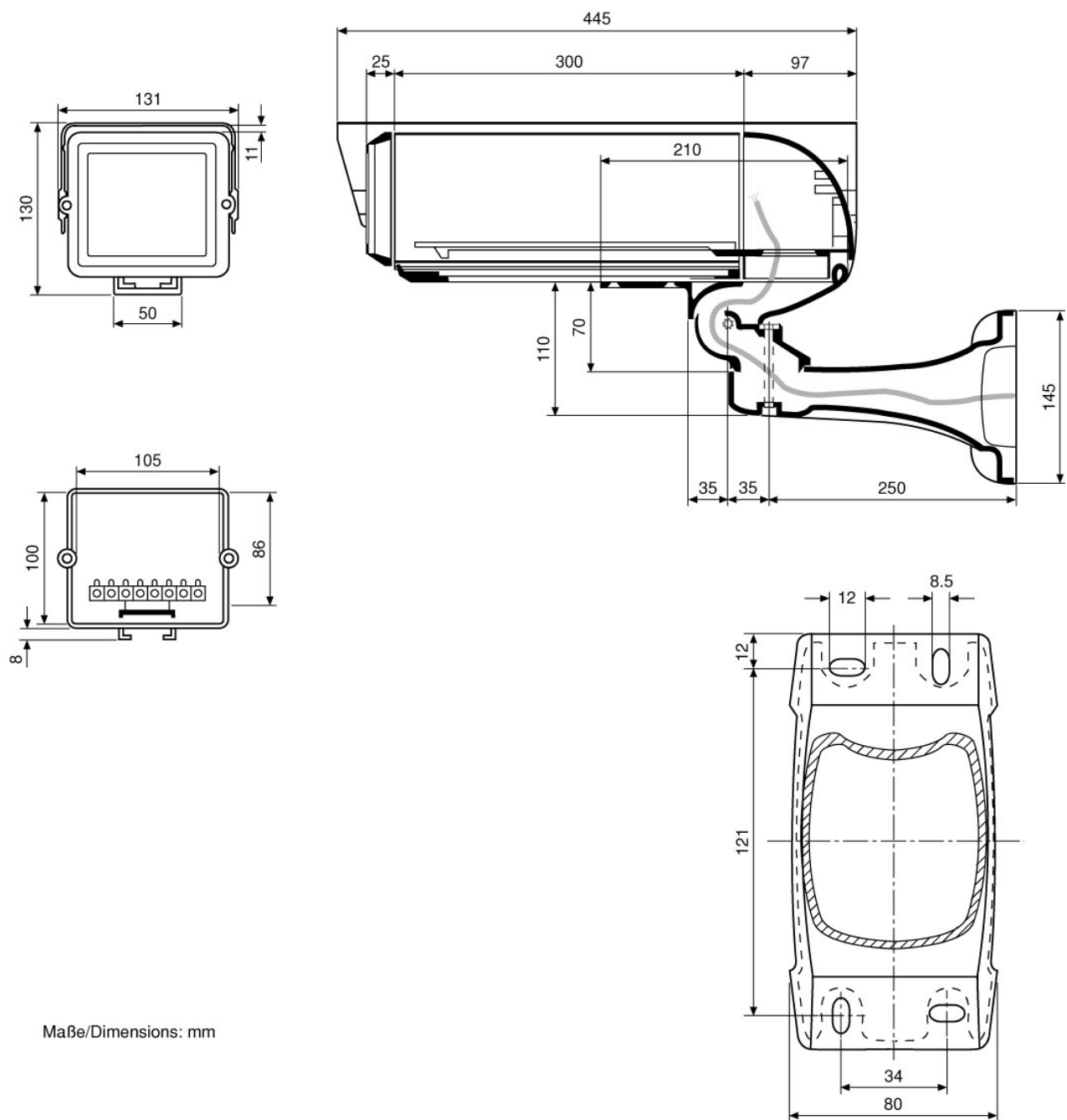
(Continuation Spezifications)

|                           |              |
|---------------------------|--------------|
| <b>Colour (housing)</b>   | RAL9002      |
| <b>Temperature range</b>  | -20°C ~+50°C |
| <b>Dimensions (HxWxD)</b> | see drawing  |
| <b>Weight</b>             | 4.0kg        |

## Optional accessories

|              |                    |                                                                                   |
|--------------|--------------------|-----------------------------------------------------------------------------------|
| <b>70457</b> | <b>AK-3</b>        | Camera Connection box, 230VAC Input, 24VAC-3.2A, 12VDC-1A Outputs                 |
| <b>79592</b> | <b>PM-6S</b>       | Pole Mount Adapter for 1 Wall Mount, (50-140mm Pole), RAL9002                     |
| <b>79604</b> | <b>SU-6</b>        | Camera Height Adjustment Kit for VHK and EHL Housings (3 Diff. Slides and Screws) |
| <b>79593</b> | <b>PM-6D</b>       | Pole Mount Adapter for 2 Wall Mounts, (50-140mm Pole), RAL9002                    |
| <b>79662</b> | <b>NE-130/12V</b>  | Power Supply Unit 230V/12VDC-1.25A for Housings VTL-WWA                           |
| <b>79613</b> | <b>CMA-2</b>       | Corner Mount Adapter for Wall Brackets WD-5, WD-7, VTL-WW, VHK-WW, RAL9002        |
| <b>77345</b> | <b>VTL-BL-230V</b> | Blower, with Thermostat 230V, for VTL-WWA housing                                 |

## Technical drawing



Maße/Dimensions: mm



# PM-6S

Home | Security | Housings | Accessories

PM-6S

Pole Mount Adapter for 1 Wall Mount,

(50-140mm Pole), RAL9002

**Art-Nr. 79592**



## Main Features

For pole mounting

Fixing for wall brackets WD-5/MK or WD-7/MK

For housing series: VTL and VTL/WW

Rugged construction

Ready for installation

## Specifications

For pole diameters

50 ~140mm

Load capacity

20kg

Kind of mounting

Screw-fixed mounting bracket and locking jaw

Material

Di-cast aluminium

Colour

RAL9002

Dimensions (HxWxD)

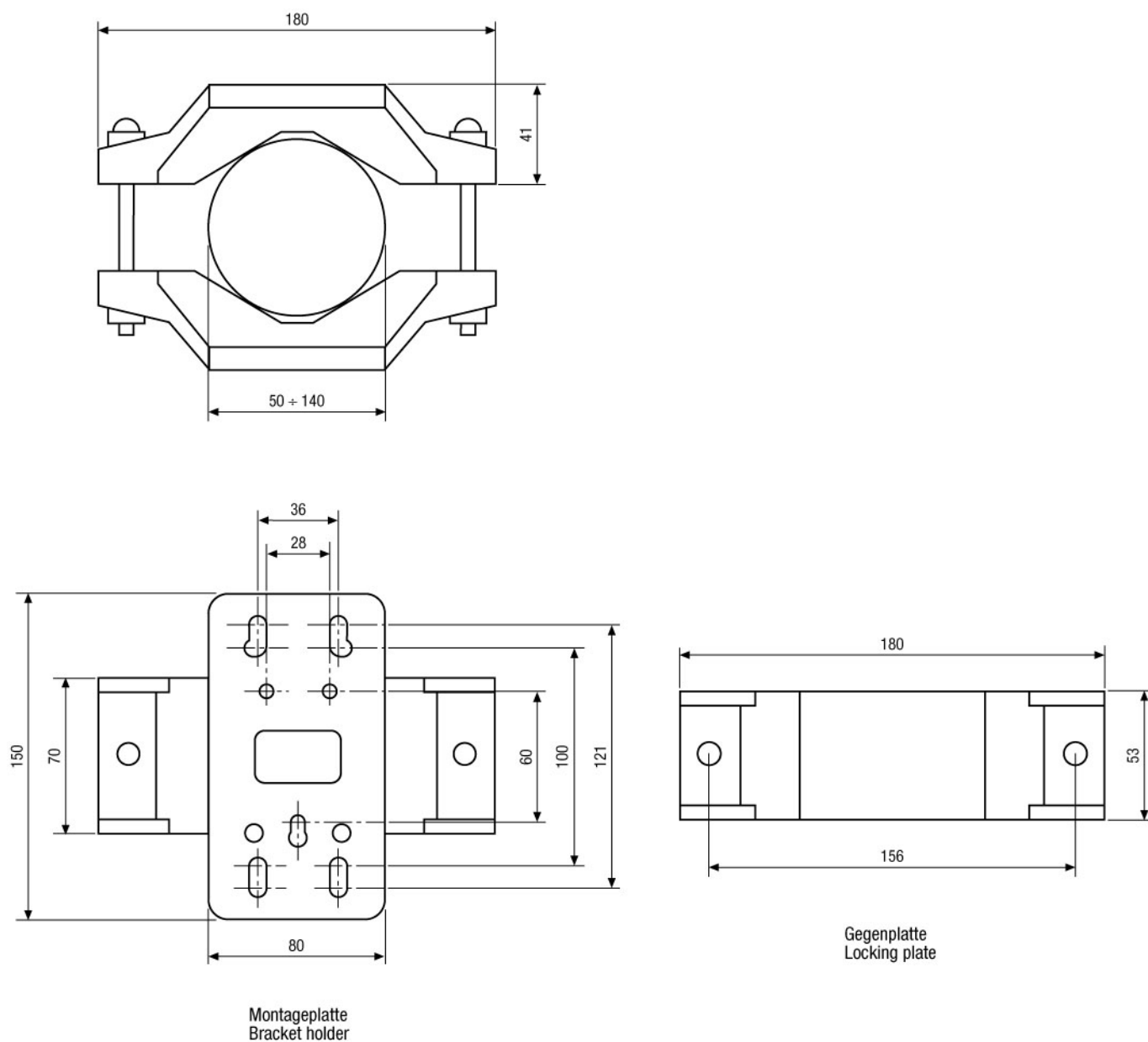
see drawing

# PM-6S

## Product information

\*) Fitted for the wall brackets WD-5/MK, WD-7/MK and WD-31/MK as well (Attention: partwise different finish)

## Technical drawing



Maße/Dimensions: mm



**VIDEOR**

# SR-313 8.3HZ

Home | Security | Thermal | Cameras

SR-313 8.3HZ

Thermal Imaging Camera, 35mm, 13° FoV, 8.3Hz,

320x240, uncooled, Heater

Art-Nr. 98485



## Main Features

Crisp thermal images (320x240)

35mm lens (13° FoV)

Frame rate: 8.3Hz

Designed for use in harsh environments

Easy-to-use / Lightweight

No maintenance required

Extremely affordable

Detection range person: up to 780m

Detection range vehicle: up to 2150m

Interfaces: RS-422, RS-232

Integrated heater

Protection rating: IP66

## Specifications

|                          |                                      |
|--------------------------|--------------------------------------|
| Resolution pixels        | 320x240                              |
| Spectral area            | 7,5 $\mu\text{m}$ - 13 $\mu\text{m}$ |
| Detection range          | 780m                                 |
| Horizontal angle of view | 13°                                  |
| Vertical angle of view   | 10°                                  |
| Frame rate               | 8.3Hz                                |
| Thermal sensitivity      | 85 mK                                |
| Lens mount               | integrated lens                      |
| Lens type                | fixed focal length                   |
| Focal length             | 35 mm                                |
| Video outputs            | composite (VBS)                      |
| e-PTZ support            | no                                   |
| Serial interfaces        | RS-422, RS-232                       |

## SR-313 8.3HZ

(Continuation Spezifications)

|                               |                                                                  |
|-------------------------------|------------------------------------------------------------------|
| Supply voltage                | 18-27VAC, 14-32VDC                                               |
| Power consumption             | 3W nominal, 24W peak (at 24VDC), 5W nominal, 33W peak (at 24VAC) |
| Housing                       | outdoor                                                          |
| Sunshield                     | no                                                               |
| Temperature range (operation) | -40°C ~+55°C                                                     |
| Protection rating             | IP66                                                             |

### Optional accessories

|       |                |                                                    |
|-------|----------------|----------------------------------------------------|
| 73691 | EM1450         | Wall Mount for light Duty Pelco housings           |
| 99077 | SR-SERIES CASE | Shipping Case, for Flir SR-Series Cameras, Plastic |



**VIDEOR**

# IR LED300C-A-50

Home | Security | Lighting | Infrared

IR LED300C-A-50  
LED Infrared Illuminator 850nm, 50° 200-240VAC,  
68W, Clear Cover

Art-Nr. 71737



## Main Features

Spectral emission: 850nm / Beam angle: 50°  
292 LEDs with narrow-band light emission  
Sensor controlled twilight switch w. IR cut filter  
Integral switching power supply with softstart  
Power supply: 200 to 240VAC, 50Hz  
Efficiency factor: 97% (cos Phi >0.9)

Low self-heating / Vibration-resistant  
Extended temperature range components included  
Natural-coloured anodized aluminium casing  
Clear plastic cover  
Protection rating: IP66  
Option: fastening, wall and ceiling mount brackets

## Specifications

|                                |                                                                                                                                                   |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Lamp type                      | LED                                                                                                                                               |
| Spectral emission              | 850 nm                                                                                                                                            |
| Spectral half-value range      | 80nm                                                                                                                                              |
| Angle of light source h        | 50°                                                                                                                                               |
| Angle of light source v        | 50°                                                                                                                                               |
| Scene coverage                 | 150 m                                                                                                                                             |
| Twilight switch                | yes, 50/130Lux (ON/OFF) sensor controlled. Permanent Illuminator function by sensor covering (adhesive tap supplied) or in case of sensor failure |
| Temperature related switch-off | At >60°C (system temperature). Automatic restart after falling below the limits                                                                   |
| Isolation strength             | Class I (leakage path =>4mm)                                                                                                                      |
| Efficiency factor              | >97% (PSU), Cos Phi: >0,9                                                                                                                         |
| Switch-on delay                | Softstart                                                                                                                                         |

# IR LED300C-A-50

(Continuation Spezifications)

|                                       |                                                   |
|---------------------------------------|---------------------------------------------------|
| Heating above ambient air temperature | Max. 35°C                                         |
| Connection                            | 2m Mains connection cable with open ends          |
| Power supply unit                     | integrated                                        |
| Protection rating                     | IP66                                              |
| Mount                                 | 2x Threads M6 (Bottom), 2x M8 for wall kit fixing |
| Supply voltage                        | 200 ~240VAC +/-10%, 50Hz                          |
| Power consumption                     | 68W                                               |
| Temperature range (operation)         | -30°C ~+50°C                                      |
| Housing                               | aluminium with plastic cover                      |
| Colour                                | Housing: anodized silver / Clear cover            |
| Dimensions (HxWxD)                    | see drawing                                       |
| Weight                                | 3.1kg                                             |

## Optional accessories

|       |            |                                                             |
|-------|------------|-------------------------------------------------------------|
| 71725 | LED-WBSET  | Wall Mount Set: Mounting Bracket and Wall Mount Bracket     |
| 79750 | WD-5/MK    | Wall Mount with Swivel Head for weatherproof Housing, black |
| 71722 | PM-80      | Pole Mount Adapter IR LED-WBSET (80-180mm Pole)             |
| 77488 | VPT/IRB-4L | L-Bracket for VPT-40, RAL7032                               |

# IR LED300C-A-50

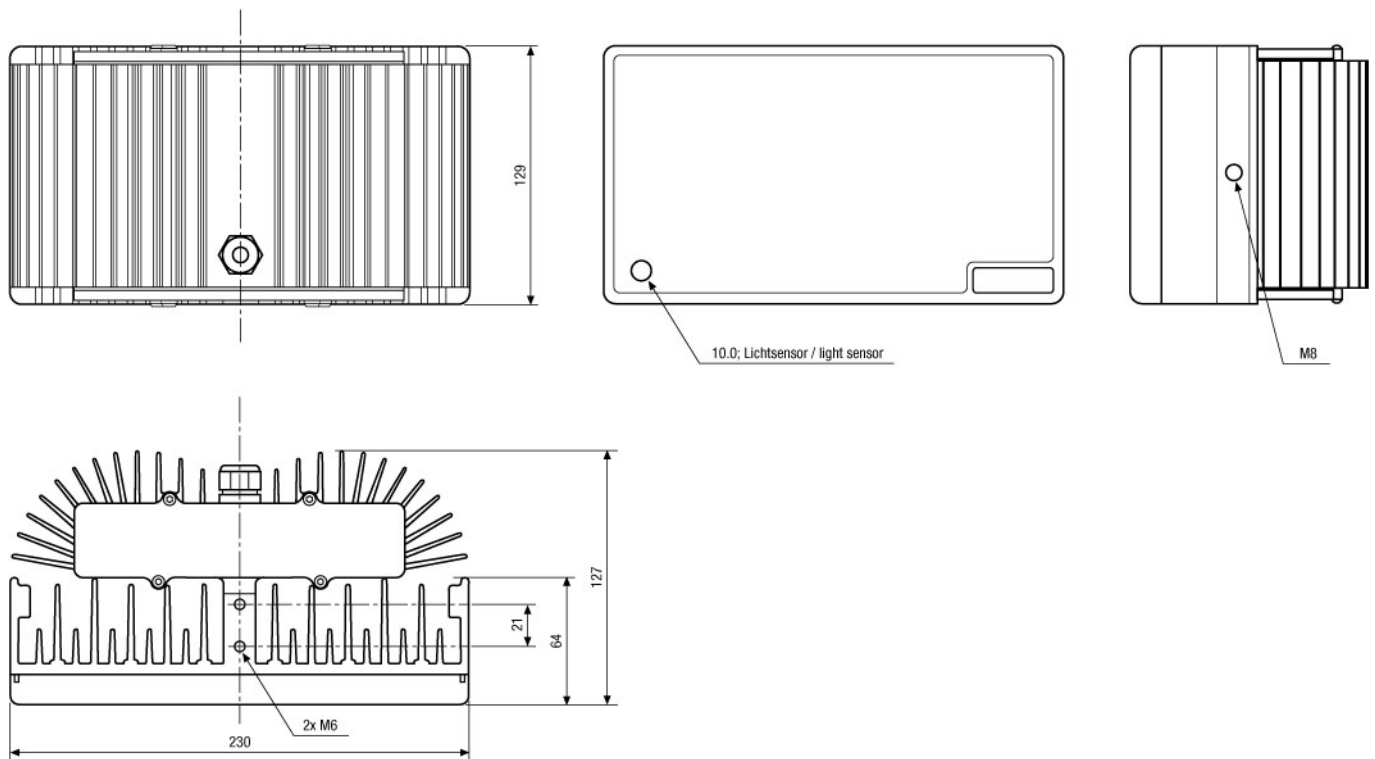
## Product information

\*) The best result will be achieved on condition that a camera is used with good sensitivity in the infra-red range, a relative lens aperture of F1.4 min. and a mean reflectance factor for spotlight objects.

# IR LED300C-A-50

Home | Security | Lighting | Infrared

## Technical drawing



# LED-WBSET

Home | Security | Lighting | Accessories

LED-WBSET

Wall Mount Set: Mounting Bracket and Wall Mount Bracket,

Art-Nr. 71725



## Main Features

Wall mount fastening for illuminators IRLED150/300

Option: pole mounting bracket

## Specifications

Material

Aluminium

Colour

Anodized aluminium (CO)

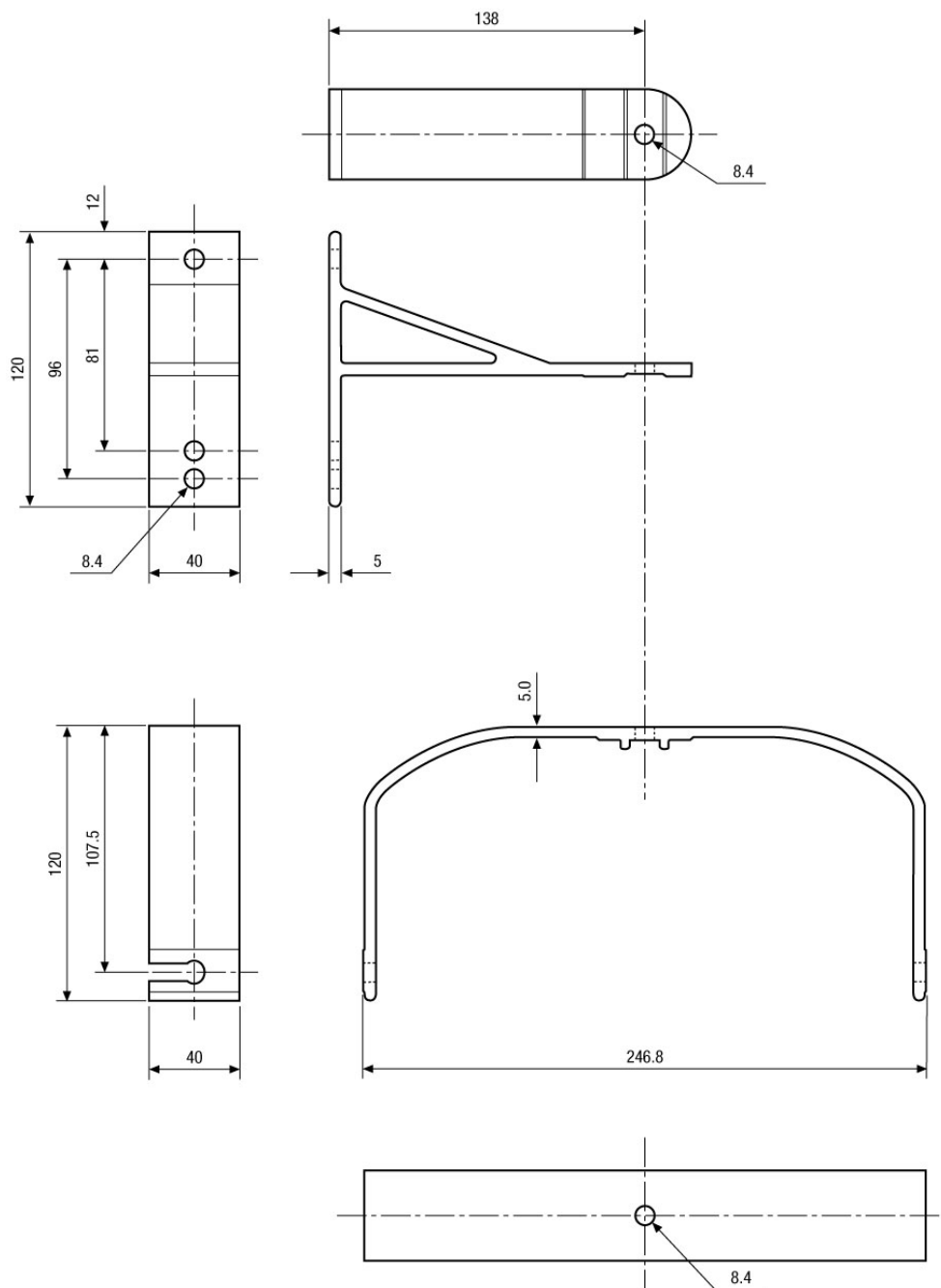
## Optional accessories

71722

PM-80

Pole Mount Adapter IR LED-WBSET (80-180mm Pole)

## Technical drawing



**VIDEOR**

# PM-80

Home | Security | Lighting | Accessories

PM-80  
Pole Mount Adapter IR LED-WBSET (80-180mm Pole),

Art-Nr. 71722



Wall mount is not included with the pole bracket

## Main Features

For Pole Mounting (80-180mm)  
For wall mount set IR LED-WBSET

Rugged, anodized aluminium construction  
Fixation with 2 flexible Steel Ties

## Specifications

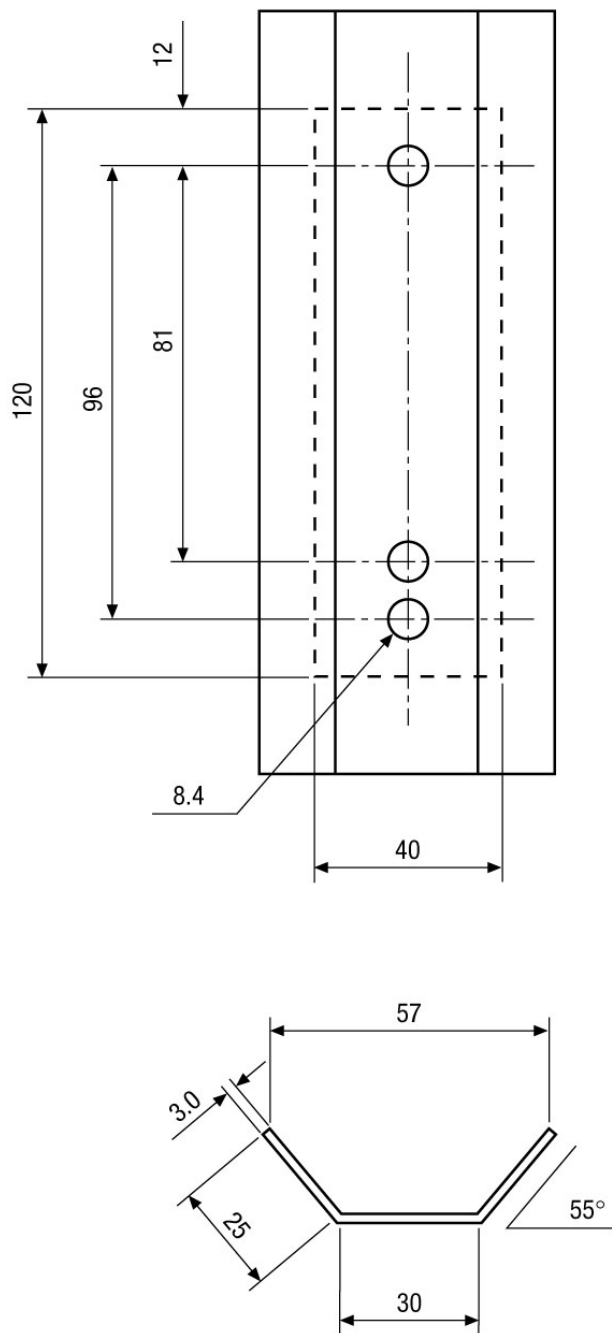
Material

Aluminium

Colour

Anodized aluminium (CO)

## Technical drawing



Maße/Dimensions: mm



**VIDEOR**

# RG 11/A/U PE

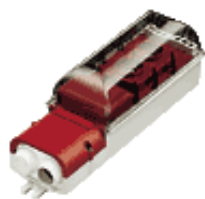
## RG-CABLE 75 Ohm

Cable for the installation outside and underground: e.g. for instance for networks of close-circuit video monitoring systems. Can be used for longer distances.

- single shielded
- high coverage of braid
- very good attenuation
- manufactured on the lines of MIL-C-17
- Made in Germany
- fulfilled RoHS (EN 2002/95 EG)



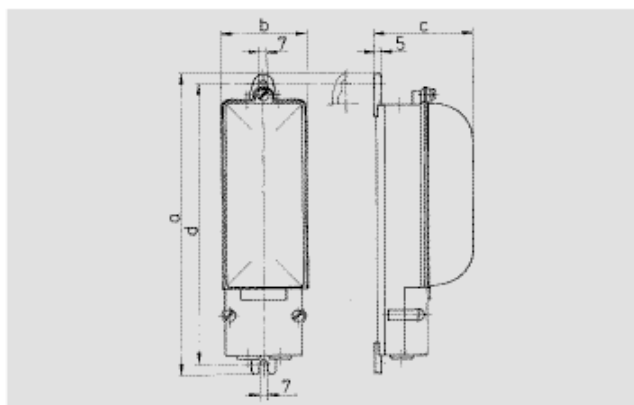
|                                                                                 |                                                     |
|---------------------------------------------------------------------------------|-----------------------------------------------------|
| <b>Building:</b>                                                                |                                                     |
| Inner conductor                                                                 | 7 x 0,40 mm copper tinned                           |
| Insulation                                                                      | 7,3 mm PE. +/- 0,1                                  |
| <b>Outer conductor</b>                                                          |                                                     |
| a)                                                                              | Copper braid bare wires                             |
| b)                                                                              |                                                     |
| c)                                                                              |                                                     |
| d)                                                                              |                                                     |
| Jacket                                                                          | 10,2 mm PE black +/- 0,2                            |
| <b>Electrical properties::</b>                                                  |                                                     |
| Impedance                                                                       | 75 Ohm +/- 3                                        |
| Capacity (pF/m)                                                                 | 67                                                  |
| Velocity (v/c)                                                                  | 0,66                                                |
| <b>Attenuation at 20°C (dB 100m)</b>                                            |                                                     |
| 10 MHz - 2,3<br>20 MHz - 3,3<br>50 MHz - 5,3<br>100 MHz - 7,7<br>200 MHz - 11,2 | 500 MHz - 18,5<br>800 MHz - 24,3<br>1000 MHz - 27,7 |
| <b>Direct current resistance (Ohm/km)</b>                                       | Inner conductor: 19                                 |
|                                                                                 | Outer conductor: 4                                  |
| <b>Mechanical properties:</b>                                                   |                                                     |
| Minimum bending radius                                                          | 50 mm                                               |
| Cable weight kg/km                                                              | +/- 125                                             |
| Copper weight kg/km                                                             | +/- 44                                              |
| Range of temperature C°                                                         | -20 bis + 70                                        |



Part no. : 10896

## Cable connection box

for lampposts with an internal diameter 82 mm or more, with smoked glass cover, with cable bushings for 1 or 2 entries of diameter 17 to 24 mm or 3 entries of diameter 15 to 19 mm, 5 mantle terminals 2x16 mm<sup>2</sup>, with one open one closed Pg 13,5/M 20 gland, factory wired



|             |   |       |
|-------------|---|-------|
| Bestell-Nr. |   | 10896 |
| Maße in mm  | a | 250   |
|             | b | 72    |
|             | c | 75    |
|             | d | 232   |
| Zeichnung   |   |       |
| 8 MB 119    |   |       |

packing unit : 0015

weight : 465 g

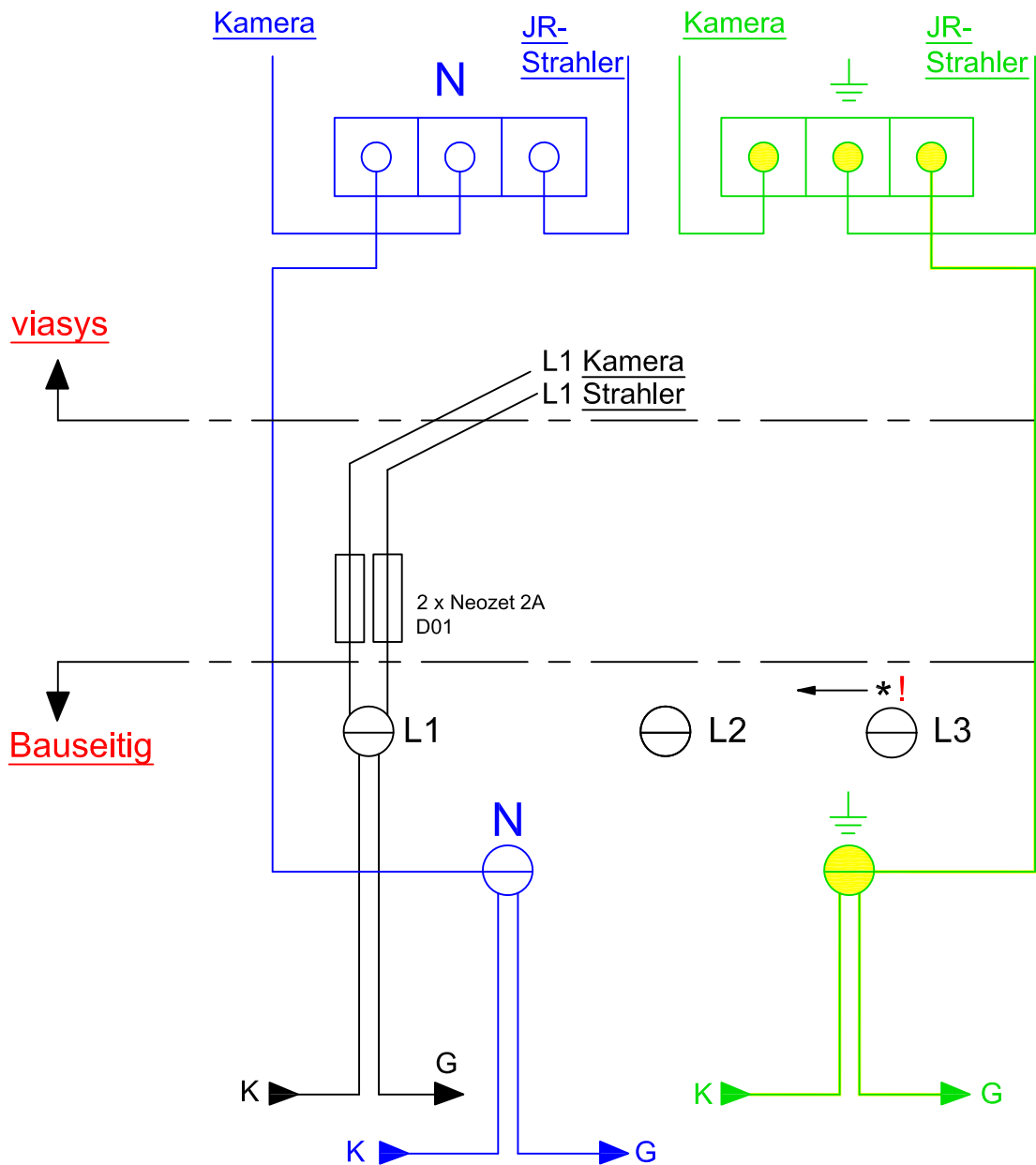
### PART NUMBERS

#### articlelist

**10896**

number neozed D01 : 2 x D01

# MENNEKES



**\* !** Anschluß L3 umklemmen auf L1

**K = KOMMEND**

**G = GEHEND**

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www.viasys-iv.com

Scale: /

Firm Name and Address

Project  
**MENNEKES**

Drawing-No.

viasys\_mennekes.dwg

Sheet

1

| No. | Re./Description | Date        | Name       | (Basis) |
|-----|-----------------|-------------|------------|---------|
|     |                 | Drawn       | 09.12.2009 | Talasz  |
|     |                 | Checkd      |            |         |
|     |                 | Norm        |            |         |
|     |                 | Project-No. |            |         |

No. Re./Description Date Name (Basis)