

Lumiglas-VISULEX Camera-System

DATA SHEET 07.70

'in-sight with far-sight'

- For inspection and long-range observation of technical processes primarily in **Ex hazardous** locations. Remote cameras also offer a simple solution to the viewing of inaccessible areas.

- The permanent availability of visual process data in a central control room saves considerable expenses such as work and travel time. Physical visits to critical production areas or external facilities are no longer required, contributing to plant safety.

The Lumiglas-VISULEX Ex Camera-System meets these requirements with optimal cost-effectiveness.

- Visual process data is displayed for monitoring, evaluation or additional processing, either shown on a terminal screen or stored in a PC, thus allowing tracking of the entire process flow.
- Lumiglas Ex-Luminaires provide additional light where necessary for optimum illumination of the subject to be observed.

Lumiglas-VISULEX Ex Camera components:

- The primary element is the Lumiglas Ex camera, either mounted on a sightglass on a reactor or overhead for area viewing, such as gates, fences, buildings...
- Pictures taken by the camera in an Ex area are fed via cable to the control room and connected either to a PC (with image processing capabilities) or to a standard monitor.
- An upstream control unit provides power to the camera, regulates data transfer and, if needed, operates the zoom lens.

The following Lumiglas-VISULEX Ex Camera system variations are available:

1. Camera with fixed lens Type K06-Ex

(shown right in picture below):

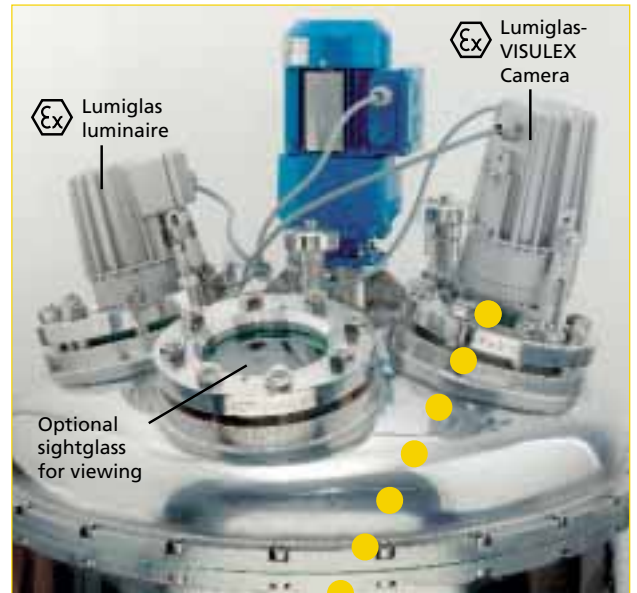
During installation of this simple standard camera, the lens is focused on the object to be observed (outdoor area, external object or process media).

For applications requiring constantly varying settings, the camera with zoom lens offers distinct advantages:

2. Camera with zoom lens Type K07-Ex

(shown left in picture below):

The zoom lens of this camera is remotely operated from the control room allowing the user to make all desired technical adjustments according to individual requirements.



Reactor in Ex area

, 500 Meters



Pictures taken by the camera are shown on a screen in the measuring and control station outside the Ex hazard zone.



Lumiglas-VISULEX Ex Camera with zoom lens Type K07-Ex

Lumiglas-VISULEX Ex Camera with fixed lens Type K06-Ex



Ex Camera Technology

• Products supplied:

1. Project-specific

depending upon the technical requirements of the facility operator, Lumiglas offers a range of services, including installation, setup and PC applications as well as all required components. In such cases costing would depend on the individual project. System specifications are developed based on a checklist.

2. Components

- 2.1 Camera (including control unit 2.2)
- 2.2 Control unit (required for camera); depending on camera type
- 2.3 Connecting cable (please check required length!)
- 2.4 Monitor
- 2.5 PC equipment (to be defined)

• Technical data:

1. Lumiglas-VISULEX Ex Camera-System:

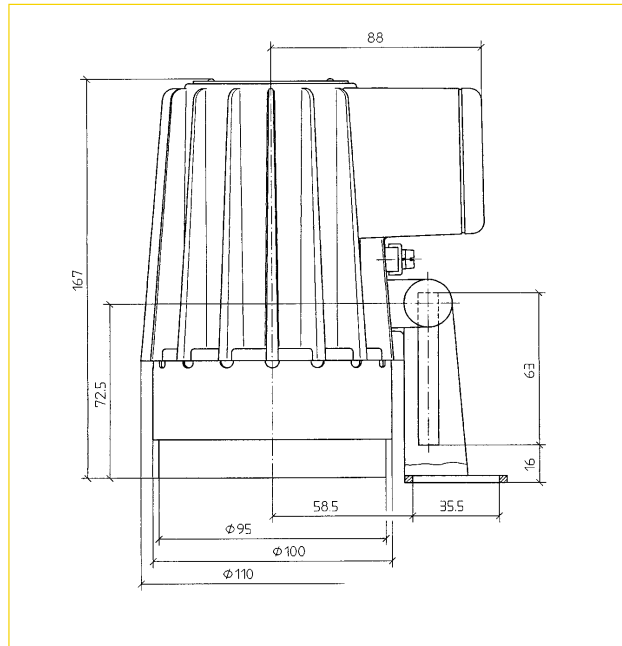
- Pressure-resistant housing including a color CCD camera, 1/4" CCD sensor, 2,5 Lux sensitivity, and a 2-wire transmitter with electronics
- Approved for Ex zones 1 and 2
- Protection type IP 67
- Operating temperature range: +5° C to +40° C
- EC-Type-Examination Certificate: DMT 01 ATEX E 047 for Camera Type K06-Ex $\text{Ex II 2G EEx de II C T6/T4}$ for Camera Type K06-Ex $\text{Ex II 2G EEx de II C T6/T4}$ for both versions $\text{Ex II 2D IP 67 T 80°C/T 130°C}$
- Ignition protection class: Camera K06-Ex: EEx de, Camera K07-Ex: EEx d(e)
- Explosion group II C
- Temperature classes: up to T6
- Electrical connection¹⁾: via control unit (non-Ex-area, e. g. in the control station) using a transmission cable
- Rated voltage: DC 24 V
Maximal voltage: DC 26.4 V
Rated output: Type K06-Ex up to 20 W
Rated output: Type K07-Ex up to 25 W
- ¹⁾ see also block diagram (page 4)

• Mounting:

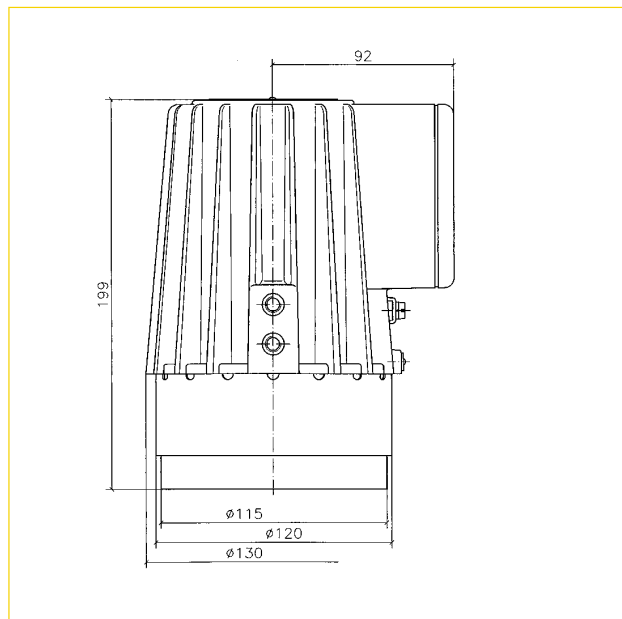
- Similar to the internationally renowned Lumiglas luminaires, the camera-system can be attached to a sightglass fitting (DIN 28120 or similar) using a hinged bracket.
- Additional illumination of the subject can be supplied by Lumiglas Ex Luminaires if required. Luminaire type and location will depend on the process, medium, reactor size and optimum angle of incidence.

• Dimensions, materials and fixtures:

Camera Type	Housing	Weight	Mounting
K06-Ex	AL	approx 1.7 kg	includes stainless steel hinged bracket
K07-Ex	AL	approx 2.7 kg	includes aluminium fixturings



Camera Type K06-Ex



Camera Type K07-Ex

Camera K07-Ex for ignition protection class 'EEx d' will be supplied without terminal box!

• **Camera specifications (standard model)**

Feature	CCIR (Europe)	EIA (USA)
Image sensor	1/4"-CCD	1/4"-CCD
Pixels	approx. 440.000	approx. 380.000
Light sensitivity	2,5 Lux (F 1.2, 50 IRE)	3 Lux (F 1.2, 50 IRE)
Resolution	470 lines (horiz.)	480 lines (horiz.)
Electronic shutter speed	automatic	automatic
SNR	48 dB	48 dB
Sensitivity control	range 300:1	range 300:1
Aperture control	automatic	automatic
Color system	PAL	NTSC

• **Lens (standard model)**

Lens type	Zoom CS Mount	Fixed lens
Focal length	6-60 mm	choice of 2.5 mm 2.9 mm 3.8 mm 6.0 mm 8.0 mm
Horizontal viewing angle at 1/4"	3.5° to 33°	at focal length 2.5 mm = 71.5° 2.9 mm = 63° 3.8 mm = 51° 6.0 mm = 33.4° 8.0 mm = 25.4°
Minimum distance between lens and subject	1.5 m	0.5 m

Other camera modules may be installed if desired.

• **2. Data transfer cable:**

- 6-strand cable with twisted pair
- Length: up to approx. 500 m
- Technical data: control lead 3P X AWG 20C (Metrofunk or similar)

• **3. Control unit:**

- Shock and impact-resistant housing
- Dimensions: 220 x 220 x 80 mm
- Elements (included):
 1. Power supply
 2. 2-wire receiver for camera signal
 3. Electronics
- Video output: 75 Ω 1 V ss
- Voltage: 230 V, 60 Hz or 120 V, 50 Hz
- Output power: 16 VA

• **4. Accessories, monitor, PC:**

- **Color video industrial monitor**

Any standard industrial monitor meeting the following requirements can be attached:

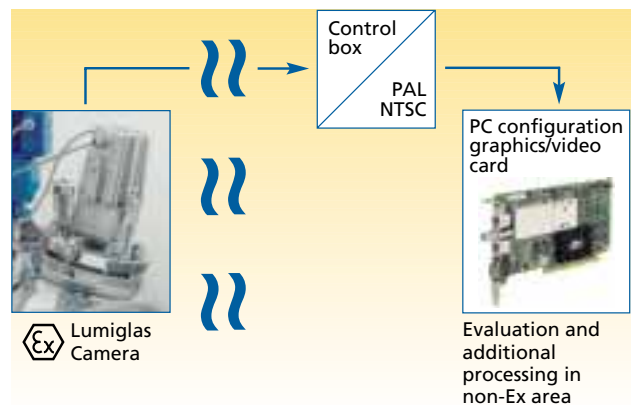
1. Voltage: 230 V, 60 Hz or 120 V, 50 Hz
2. Input signal: 75 Ω 1 V ss
3. Requires 75 Ω BNC-coaxial cable

- **PC system requirements:**

Image processing: hardware, software

Recommended graphics/video card:

See items 1 or 2



• **Item 1**

ATI All in Wonder 128 AGP/128 PCI

System requirements:

1. Windows 95/98
2. PCI version: Pentium 200 MMX/II/III or compatible PCI system; 33 MHz PCI bus 2.1
3. AGP version: Pentium II or compatible PCI system with AGP 2X bus (AGP 1.0)
4. Software is provided on CD-Rom.
5. DVD display requires a DVD-capatable drive.

Input/output:

1. PC monitor: 15 pin VGA
2. Input/Output connectors for audio and video (VHS and S-VHS)

• **Item 2**

ATI All in Wonder Radeon 32 MB AGP

System requirements:

1. Intel Pentium® III/II/Celeron or compatible; with AGP 2X/4X
2. AGP 2.0 compatible
3. Software is provided on CD-Rom
4. DVD display requires a DVD-capatable drive

Input/output:

1. PC monitor: 15 pin VGA
2. DVI-I output (VGA monitor using DVI-I to VGA adapter)
3. Inputs for stereo audio, S-video and composite video
4. External stereo connection to sound card line input
5. Dolby® digital stereo output (S/PDIF)



Ex Camera Technology

• Software

The software supplied with the video cards includes the following functions: freeze-frame in variable sizes, support of graphic formats including BMP, JPG, Tiff, video clips, real-time image on the monitor.

• Images

The following programs are suitable for processing freeze-frame images: Micrografx Picture Publisher, Adobe, Microsoft products. The following image processing features are possible: image brightness, color, contrast, JPEG compression (for the Internet).

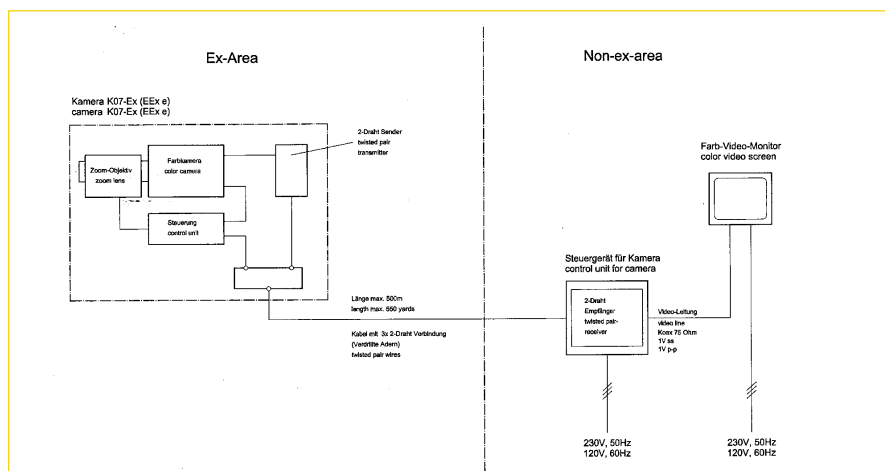
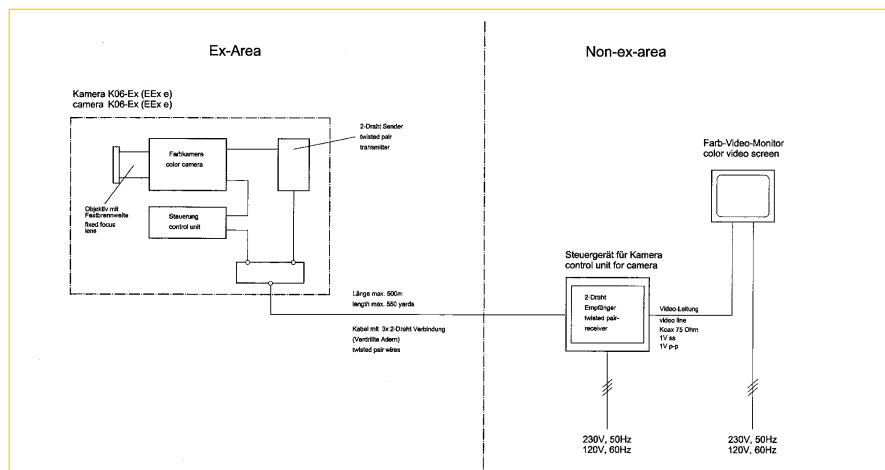
• Video

The following programs can be used to process video clips: Adobe Premiere, Ulead Video Studio. The following video processes are possible: speed, brightness, contrast, video editing, transitions, subtitles.

• Archiving

Image archiving can be performed using CD, DVD, ZIP, streaming video or storage on a server.

• Wiring Diagram to Lumiglas-VISULEX Ex Camera-System K06-Ex and K07-Ex:



All dimensions in mm unless stated otherwise. Subject to change without prior notice.
 VW 2x1000/10.02 3755.271

• Product checklist

Item	Product	Housing	Part No.
1	Lumiglas-VISULEX Ex Camera Type K06-Ex with stainless steel bracket	AL	2348.(012-016).00 depending on fixed lens*
2	Lumiglas-VISULEX Ex Camera Type K07-Ex with aluminium angle bracket	AL	2348.011.00
3	Control unit (230 V \pm) required for item 1, K06-Ex		K06 1708.018.00
4	Control unit (230 V \pm) required for item 2, K07-Ex		K07 1708.017.00
5	Cable (please provide required length in meters!)		
6	Industrial monitor (please provide desired screen size!)		
7	PC (please provide desired configuration!)		

* depending on fixed length model number as follows:

Items	Fixed lens	Part number
1	2.5 mm	2438.012.00
2	2.9 mm	2438.013.00
3	3.8 mm	2438.014.00
4	6.0 mm	2438.015.00
5	8.0 mm	2438.016.00