

## Lumiglas® VISULEX Ex Camera System

**for inspection and long-range observation of technical processes primarily in Ex hazardous locations.**

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.

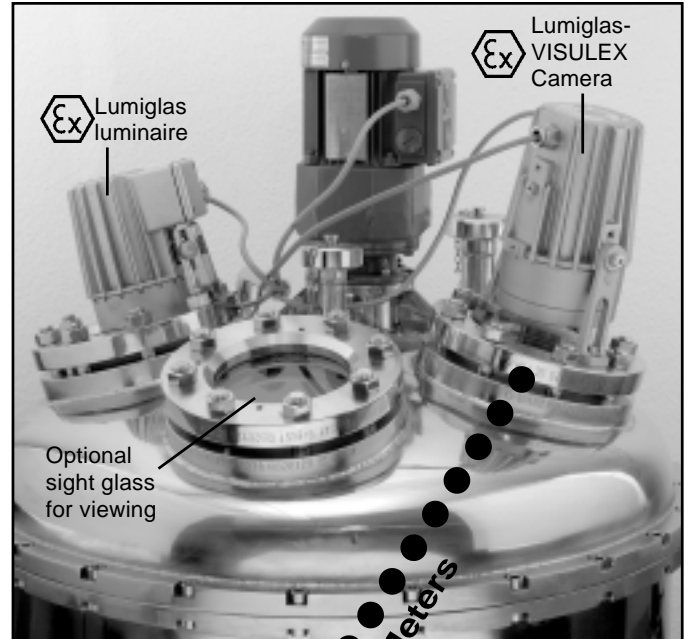
Visual process data is displayed for monitoring, evaluation or additional processing, either shown on a terminal screen or stored in a PC, thus allowing tracking of the entire process flow.

### Lumiglas-VISULEX Ex Camera components:

- The primary element is the Lumiglas Ex camera, either mounted on a sight glass on a reactor or overhead for area viewing.
- Pictures taken by the camera in an Ex area are fed via cable (1000 m maximum) 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.

Similar to the internationally renowned Lumiglas luminaires, the camera system can be attached to a sight glass fitting (DIN 28120 or similar) using a hinged bracket. If the standard illumination of the process is not sufficient, an additional Lumiglas luminaire can be attached if fitting allows.

Depending upon the process and reactor size, a separate light port and camera port may be the best design. The application would depend upon the fixture size and medium as well as angle of incidence.



Reactor in Ex area



Measuring and control station in control room can be up to 1000 meters outside the Ex hazard zone.



Lumiglas-VISULEX Ex camera



Images captured by the camera are transmitted to a display in the control room (left: control unit)



## A. VISULEX Ex camera system options:

### 1. Camera with fixed lens Type K06-Ex (shown right in picture):

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):

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. Camera, without terminal box, comes equipped with 5m cable.

## B. 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

- Camera
- Control unit (required for camera)
- Connecting cable
- Monitor
- PC equipment

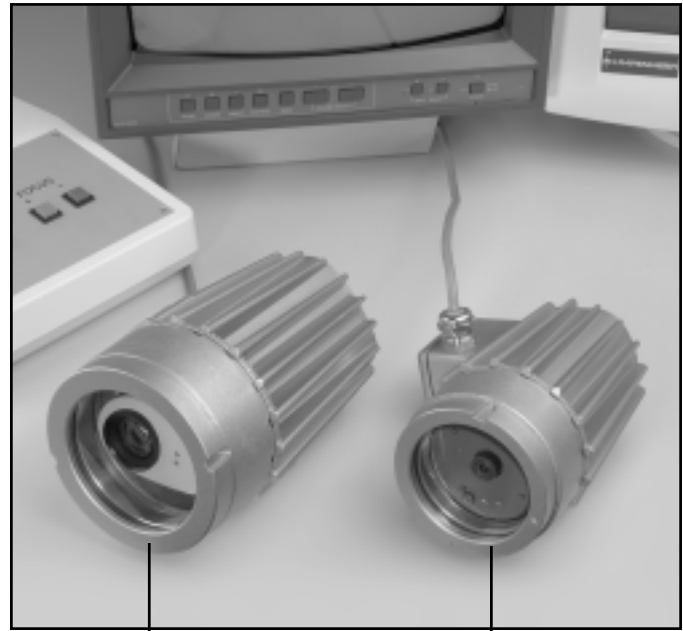
## C. Technical data:

### 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: +41°F to 104°F (+5°C to +40°C)
- EC type test certification: DMT 01 ATEX E 047  
for Camera Type K06-Ex  II 2G EEx de II C T6/T4  
for Camera Type K07-Ex  II 2G EEx d II C T6/T4  
for both versions  II 2D IP 67 T 80°C/T 130°C
- Ignition protection class: Camera K06-Ex: EEx de, Camera K07-Ex: EEx d
- Explosion group II C
- Temperature classes: up to T6 @ 104°F (40°C) ambient
- Electrical connection<sup>1)</sup> via control unit in the control room (non-Ex-area) using a transmission cable.
- Rated voltage: DC 24 V  
Maximum voltage: DC 26.4 V  
Rated output: Type K06-Ex up to 20 W  
Rated output: Type K07-Ex up to 25 W  
<sup>1)</sup> see also block diagram (page 4)

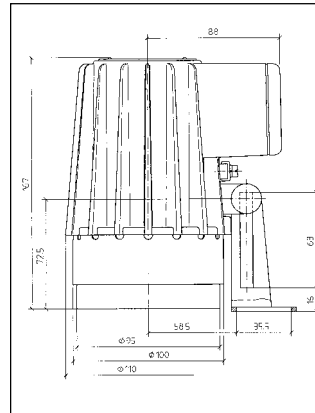
### Dimensions, materials and fixtures:

Camera type	Housing	Weight	Mounting
K06-Ex	AL	approx 1.7 kg	Includes stainless steel hinged bracket
K07-Ex	AL	approx 2.7 kg (without cable)	Includes AL straight or angle bracket

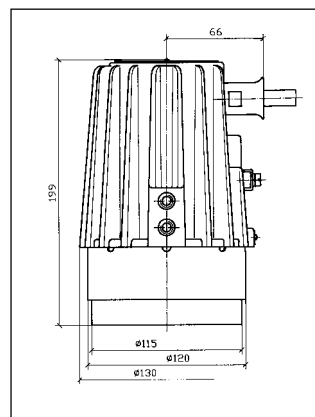


Lumiglas-VISULEX-Ex  
Camera with zoom lens  
Type K07-Ex

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



Camera Type K06-Ex



Camera Type K07-Ex

**Camera specifications (standard EIA model)**

Feature	Zoom Lens	Fixed Lens
Image Sensor	1/4" CCD	1/4" CCD
Pixels	380,000 (approx.)	380,000 (approx.)
Light Sensitivity	4 Lux	3 Lux (F 1.2, 50 IRE)
Resolution	470 Horiz. TV lines	480 Horiz. TV lines
Electronic shutter speed	1/4 - 1/10,000	1/60 - 1/10,000
SNR	50dB	48dB
Gain	-3 to 18dB	--
Sensitivity control	Range 300:1	Range 300:1
Aperture control	Automatic/Manual	Automatic
Auto Focus	One push auto focus	--
Digital Picture Effects	On screen display	--
Color system	NTSC	NTSC

The camera can be controlled by optional software via the serial connector of a PC.

**Lens Specifications (standard EIA model)**

Lens type	Zoom Lens	Fixed lens
Horizontal viewing angle at 1/4"	4.6° to 46°	at focal length: 2.5 mm = 71.5° 2.9 mm = 63.0° 3.8 mm = 51.0° 6.0 mm = 33.4° 8.0 mm = 25.4°
Minimum distance between lens and subject	30 mm (@ focal length 4.2)	80 mm (@ focal length 2.5)
Optical Zoom	10 x Zoom (f = 4.2 - 42)	--
Digital Zoom	4x	--

Other cameras may be installed if desired.

**2. Data transfer cable:**

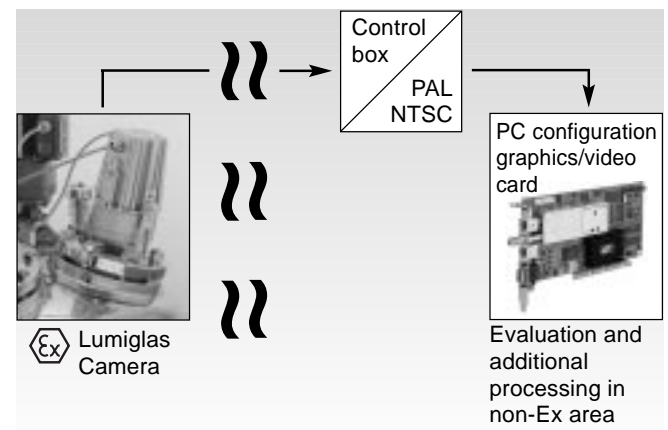
- 6-strand cable with twisted pair
- Length: 1,000 m max.
- Technical data: control lead 3P X AWG 20C (Metrofunk or similar)
- K07-Ex Camera, without terminal box, comes equipped with 5m cable

**3. Control unit**

- Shock and impact-resistant plastic housing
- Dimensions: 220 x 220 x 80 mm
- Elements:
  - Power supply
  - 2-wire receiver for camera signal
  - Electronics
  - Video output: 75 ohm 1 V ss
- Voltage: 120 V, 60 Hz or 230 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:
  - Voltage: 120 V, 60 Hz or 230 V, 50 Hz
  - Input signal: 75 ohm 1 Vpp
  - Requires 75 ohm coaxial cable
- **PC System Requirements:**
  - Pentium III/IV 600 MHz
  - Windows 98-2000
  - CD ROM or DVD drive
  - PCI or AGP connector
  - 128 MB RAM
  - Image processing hardware and software
    - ATI All-in-Wonder Pro (or compatible) or
    - ATI All-in-Wonder Radeon (or compatible)
  - Software is provided on CD ROM or DVD and graphics card



**• 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: Micrografix 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.

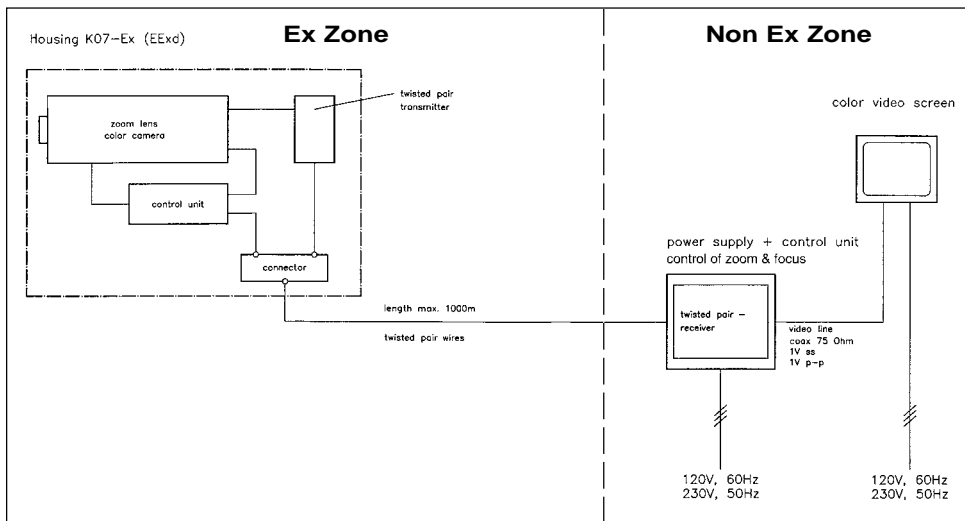
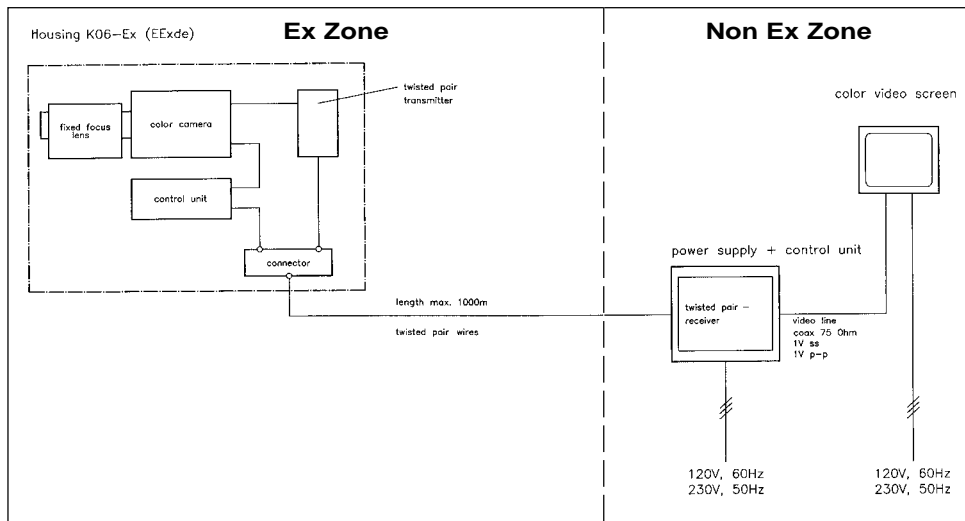
**• Archiving**

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

**Product checklist**

Item	Product	Housing	Item No.
1	Lumiglas VISULEX Ex Camera Type K06-Ex with stainless steel bracket	AL	2348.001.00
2	Lumiglas VISULEX Ex Camera Type K07-Ex with aluminium angle bracket	AL	2348.002.00
3	Control unit (required for items 1 and 2)	Plastic	K06:1708.017.00 K07:1708.018.00
4	Cable (please provide required length in meters!)		
5	Industrial monitor (please provide desired screen size!)		
6	PC (please provide desired configuration!)		
7	Graphics Card	PCI AGP	

**Wiring Diagram K06-Ex and K07-Ex:**



All dimensions in mm unless stated otherwise. Subject to change without prior notice