



## TV System Proton 3

Solution:  
Inspection, Monitoring of operations

- Radiation tolerance  $5.5 \times 10^5$  Rad
- Color Full HD image (1080p)
- 10x optical zoom
- Laser measuring system
- Ultra-reliable Pan&Tilt device
- Developed according to FME prevention principles
- Portable waterproof design (IP68)

### Inspection & Monitoring Application

Diakont TV system Proton 3 is the next evolution in refueling, decommissioning support camera systems. Simply deploy and instantly have high-resolution video to support your operations.

With its powerful 10x zoom, a state-of-the-art CMOS Full HD color sensor, custom designed radiation tolerant electronics, pan/tilt unit and super-bright LEDs it is extremely-useful tool for use in the refueling cavity, reactor vessel, water in high radiation field.

TV camera Proton A is fabricated from rugged, easily-decontaminated anodized aluminum, and the straightforward refurbishment process makes for a minimal cost of ownership.

The load-carrying cable allows the operator to deploy the camera without a requirement for poles or robotics.



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### PTZ Functions

Integrated Pan&Tilt unit provides full panoramic view due to continuous rotation ( $\pm 360^\circ$ ) and tilt (from  $+45^\circ$  to  $-225^\circ$ ). The TV camera has a transport position ( $+90^\circ$ ) when the lens is turned vertically upward to protect camera from damage during transportation.

10x optical zoom lens provides possibility to reliably reveal and examine various inspection objects from long distances. Proton 3 design excludes possibility of camera stuck in confined areas.

### Inspection & Monitoring Applications

- Monitor reactor assembly/disassembly
- Monitor tool deployment and operation
- FA S/N verification ("core mapping")
- Inspection of reactor internals and steam dryer OD
- Monitor cask loading activities



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### Portable Control Unit PCU-PRO

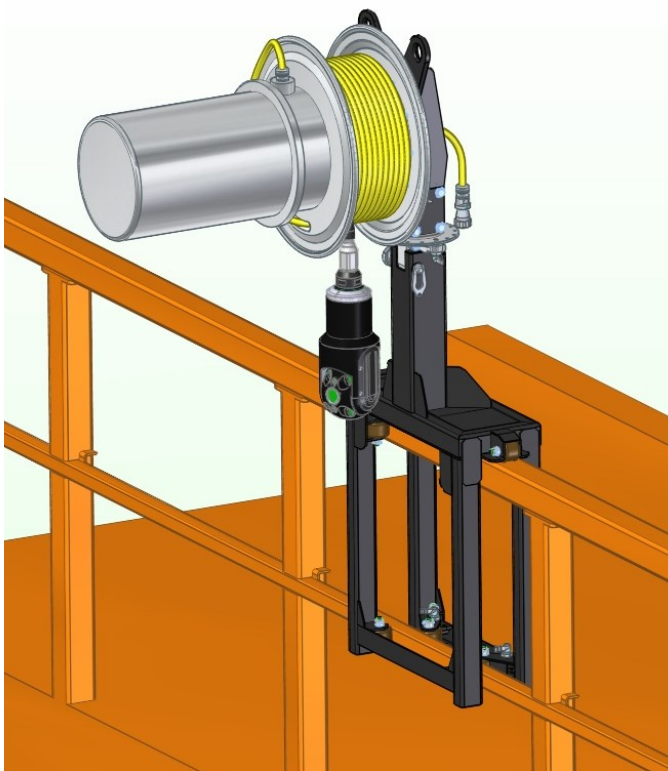
Control unit is developed in portable design to reduce the deployment time of the Proton 3 system, facilitate transportation and increase convenience of use.

The portable unit combines all necessary for operator functions:

- video imaging,
- remote control of all PTZ functions,
- recording of video and audio,
- layout of operator comments,
- pan/tilt and zoom feedback sensors actual readings .

The system can be additionally equipped with a cable reel. Available cable reel types:

- standard cable reel
- cable reel with slip ring
- spring loaded or motorized cable reel with a slip ring.



### Measuring function

TV System Proton 3 has a built-in laser measuring device. This device in combination with convenient and functional software of the complex allows to measure objects with high accuracy.

### Intelligent Software

Diakont has developed special intelligent Software modules to improve video quality:

- Lens brownning/distortion correction
- Radiation noise filtering
- Temperature noise filtering
- Rad. exposure level estimation based on image noise level



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## TV Camera Proton A Specification

Resolution	1080p
Sensitivity	<1 lux
Image	Color
Optical zoom	10x
Digital zoom	4x
Angle of view horizontal (air/water)	6° - 56° / 5° - 42°
Range of operating distance: - close border in wide angle of view  - close border in tele angle of view - farther border	1 mm ( <i>Lens can be focused at distance 0 mm from porthole</i> ) 250 mm ∞
Laser lights operating distance - in air - in water	up to 10 m up to 3 m
Pan range	± 360° ( <i>continuously</i> )
Tilt range	315° ( <i>with transport position</i> )
Lights	LED 4x10W
Operating temperature range - in water, technical aqueous solution, - in air	from 5 to 65°C from 5 to 55°C
Housing material	Aluminum with protective coating
Radiation tolerance (dose rate)	1×10 <sup>3</sup> Gy/h (1×10 <sup>5</sup> Rad/h)
Radiation tolerance (total dose)	5.5×10 <sup>3</sup> Gy (5.5×10 <sup>5</sup> Rad)
Waterproof	IP 68 ( <i>submersible 50m</i> )
Dimensions, (D×H)	Ø145×386 mm
Weight	~12.5 kg

\* Diakont reserve the right to alter specifications without prior notice



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