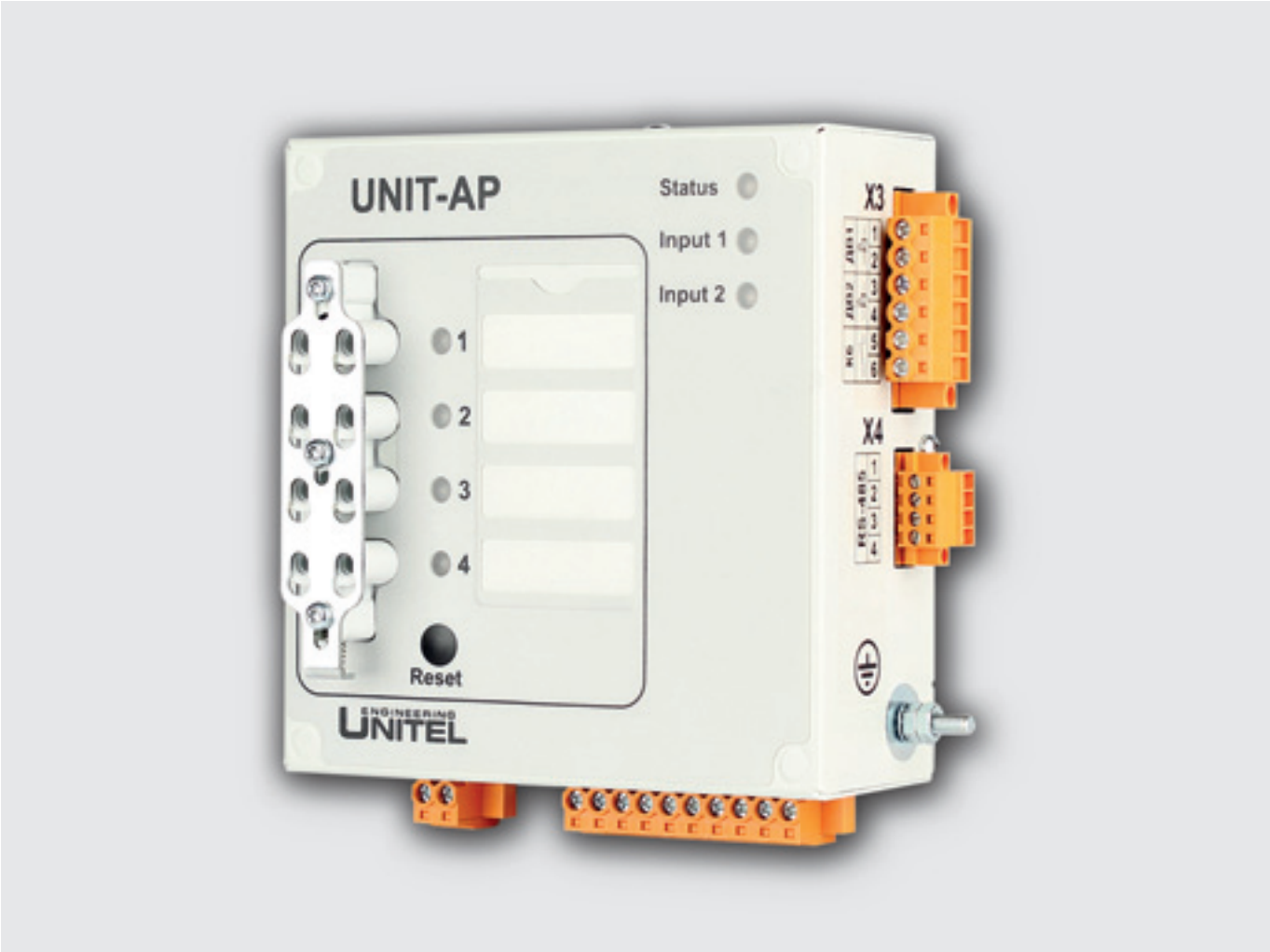
ENGINEERING UNITEL



ARC PROTECTION RELAY

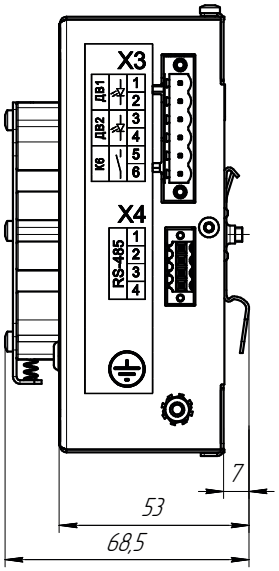
UNIT-AP

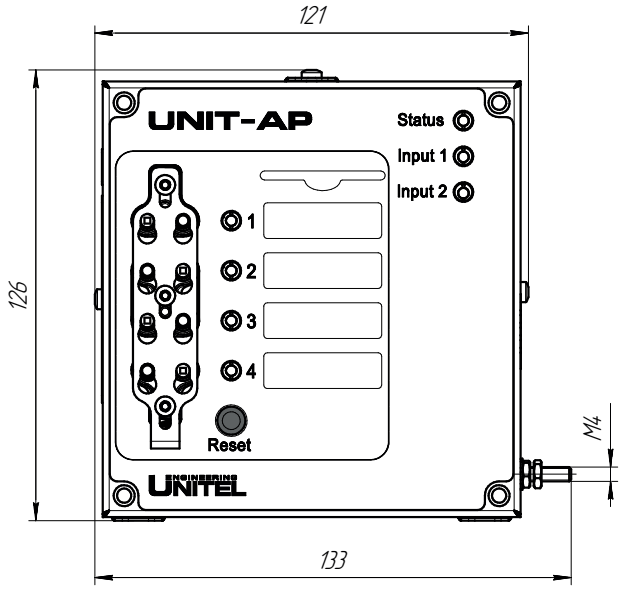
ARC PROTECTION RELAY

UNIT-AP

USE OF THE RELAY

The UNIT-AP device is designed for instantaneous arc fault protection.
Can be used in low or medium voltage switchgears with the alternating, direct or rectified control current.
In a short circuit accompanied by an opened arc, the fiber optic sensor (FOS) can quickly localize the fault.
Minimizes damage of electrical equipment, improves the reliability of power supply and increases the safety of staff.





FUNCTIONS AND FEATURES

- High-speed arc detection via fiber optic sensors
- Extremely short operating time (≤1 ms)
- Up to 4 loop sensors (max length 10 m of each) or 2 radial sensors (max length 25 m) resistant to the EMC influences and sensitive to the radiation pulses in the visible wavelength range
- 6 output relays (2xHigh-speed solid state relays, 3xSignalization relays, IRF)
- Up to 2 binary inputs (OCP start signal monitoring from an external relay)
- 7xLEDs, «Reset» button on the front panel
- CBFP
- Configurable software logic
- Communication port 1xRS-485 (Modbus RTU)
- Free software for configuring and monitoring
- Time synchronization

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A. DESIGN WITH THE LOOP CONNECTION OF SENSORS

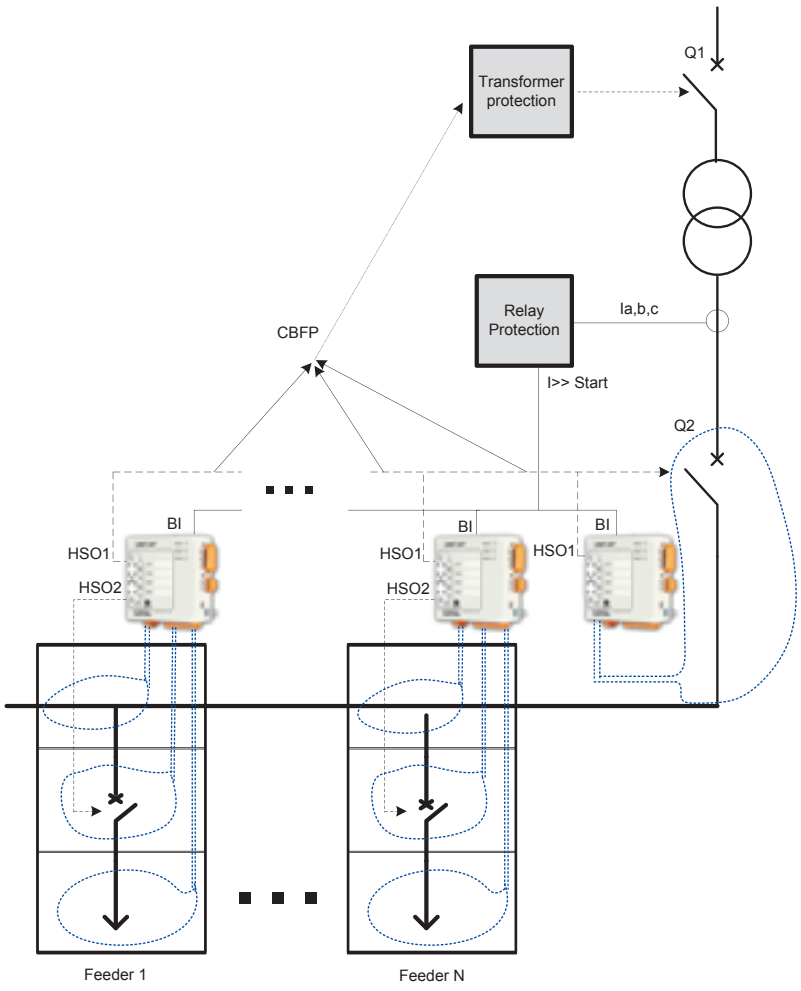

Figure 1. Application example 1 – The arc sensor loops passes through all the spaces that are to be protected

B. DESIGN WITH THE RADIAL CONNECTION OF SENSORS

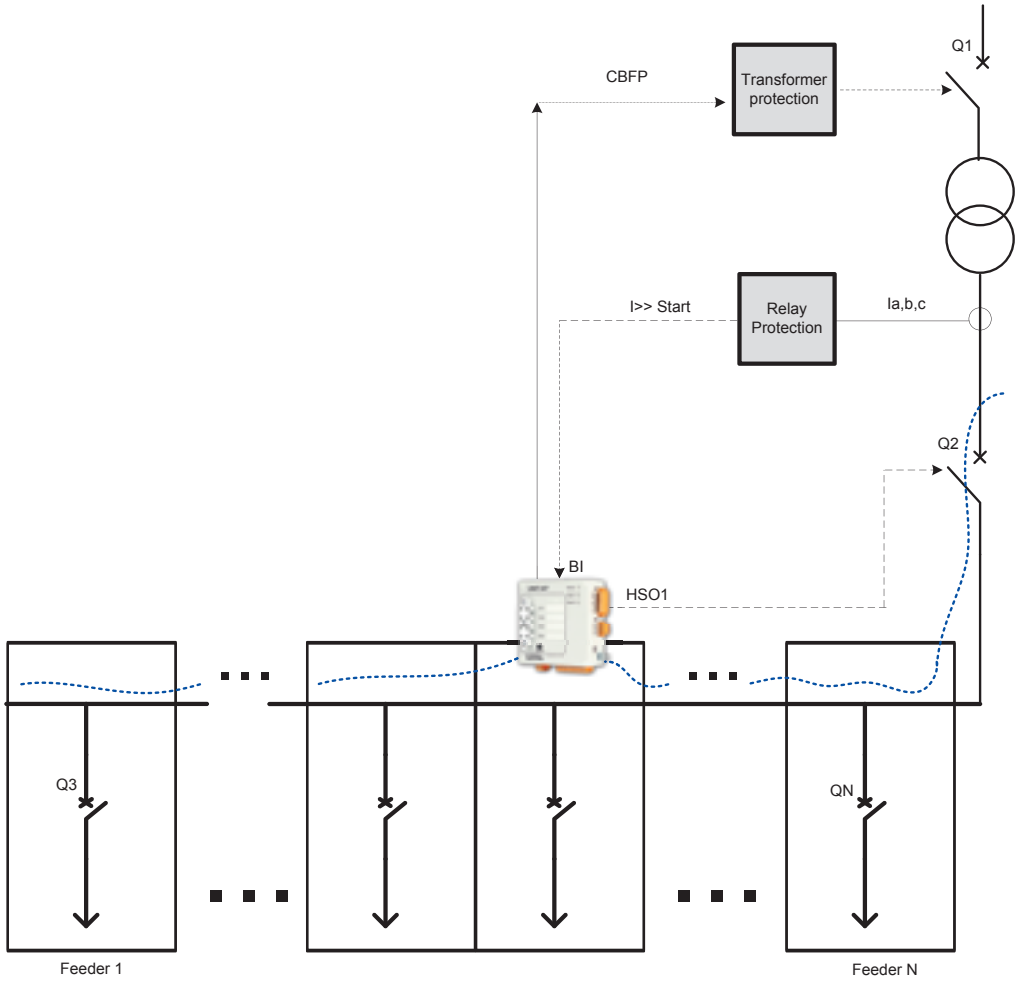

Figure 2. Application example 2 – The terminal end of the fiber optic sensor has not been brought back to the Arc protection relay

ARC PROTECTION RELAY

UNIT-AP

CONNECTION DIAGRAM

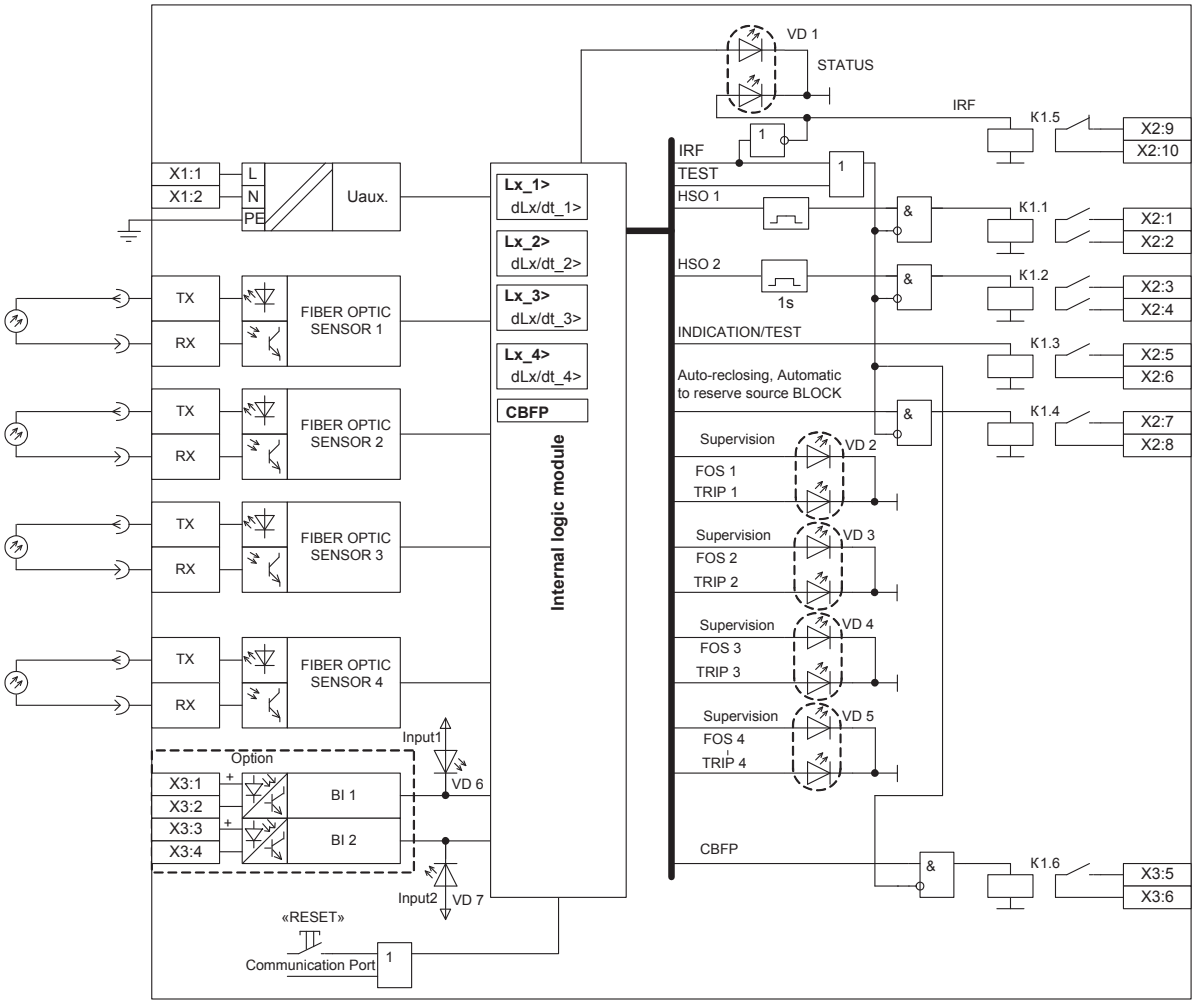

Figure 3. Connection diagram: UNIT-AP with loop connection of FOS's

ARC PROTECTION RELAY

UNIT-AP

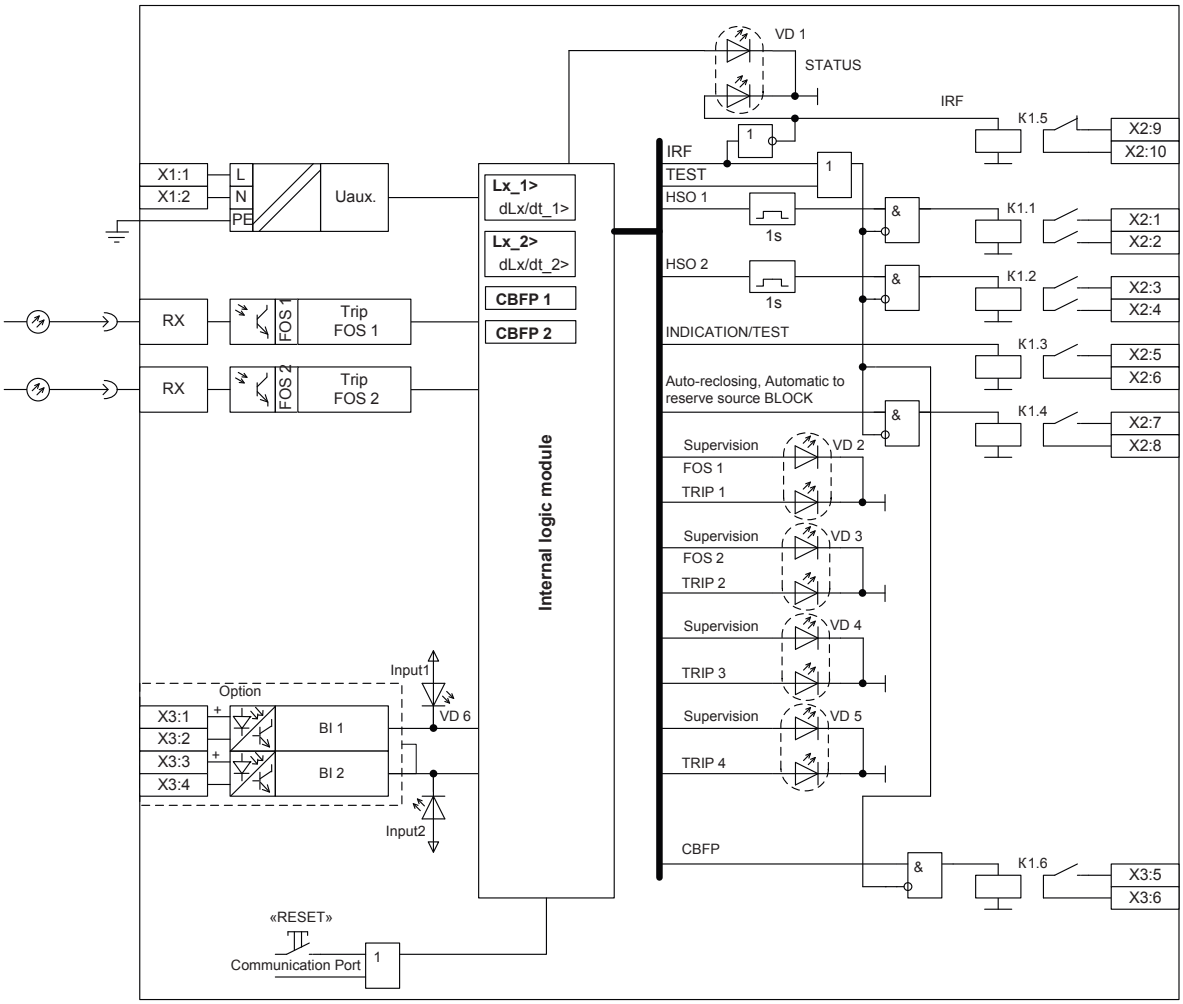

Figure 4. Connection diagram: UNIT-AP with radial connection of FOS's

TECHNICAL DATA

Value designation / operating mode	Value
Rated operating voltage, V DC/AC	110 or 220
Power consumption, W	≤ 2
Weight, kg	~1.5
Total minimum response time (from the moment of the arc detection to the moment of HSO relay closing)	< 1 ms
Number of inputs for the fiber optic arc sensors	4
Number of outputs	2 High speed trip relays (HSO)
	4 TRIP relays (signal generation for the alarm or event recorder and, etc.)

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Value designation / operating mode	Value
Number of binary inputs	Up to 2 (optional)
Self-test period of the sensor loop (for loop-type connection), sec.	15
Time of readiness of the relay to perform its functions after the supply of operating current, seconds no more than	0.3
Operation time at full power failure, seconds not less than	0.5
Communication port (communication protocol)	1 x RS485 (Modbus RTU)
Mounting method	on the metal profile (DIN)

OPERATION CONDITIONS

The relay is manufactured in the climatic modification UHL3.1 and is designed for the operation with the following values of climatic factors and the environmental conditions:

- Operating temperature range -40… +55°C
- The upper operating value of the relative humidity is not more than 98% at + 25°C without moisture loss.

Code unit of order	Identification	Remarks
Device designation	UNIT-AP	Protection device from arcing fault
FOS type	R	Radial
	L	Loop
FOS quantity	2, 4	2 for type R, 4 for type L
Operating voltage	1	110 V
	2	220 V
Type of operating voltage	D	Direct
	C	Alternating
Number of binary inputs	0	N/A
	1	one Binary Input
	2	two Binary Inputs

Example of an order code for UNIT-AP:
UNIT-AP L4-2D-2 – Arc protection relay, 4 loop FOSs, 2 binary inputs, 220VDC, DIN-rail mounting.

The structure of the EWS symbol for the acquisition of the UNIT-AP device:
<Name> <Modification> – <Total length of FOS, m> [κ] [Length of connecting section of FOS, m]

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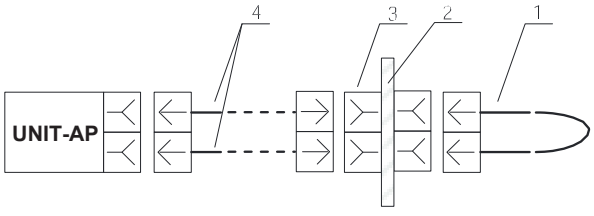
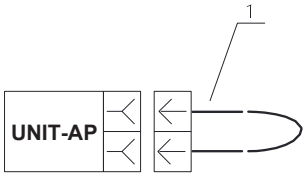
Code unit of order	Identification	Remarks
Designation	FOS	fiber-optic sensor
Type	R	Radial
	L	Loop
FOS total length, m	2,5	2.5 meters
	5	5 meters
	10	10 meters
	15	15 meters (only for radial connection)
	20	20 meters (only for radial connection)
	25	25 meters (only for radial connection)
Combined (aggregate) type	к	FOS combined configuration
		FOS standard configuration
Length of the connecting section of the FOS, m	1..4	For FOS of loop type, the length should not exceed the value calculated by the formula (Total length of FOS-2) / 2; For FOS of radial type, the length should not exceed the value calculated by the formula (Total length of FOS – 2);

Example of an order code for FOS:
FOS-L-10 – fiber-optic sensor for loop wiring diagram, 10 meters in length.

- The loop-type FOS's of the combined configuration consist of:
- Connecting (not sensitive to light) section (pos. 4 of the figure);
- The fiber optic connector (pos. 3 of the figure) mounted on the mounting plate (pos. 2 of the figure);
- The photosensitive section (pos. 1 of the figure):



The loop-type FOS's of the standard configuration including only the photosensitive section (figure 1):



The radial type FOS's of the combined configuration consist of:

- Connecting (not sensitive to light) section (pos. 4 of the figure);
- The fiber optic connector (pos. 3 of the figure) mounted on the mounting plate (pos. 2 of the figure);
- The photosensitive area (pos. 1 of the figure):

The radial-type FOS's of the standard configuration including only the photosensitive section (pos.1 of the figure):