INTRUDER ALARM EQUIPMENT

Since 1993 RIELTA JSC has achieved ever-increasing success as a developer and manufacturer of security and fire-alarm products. Over this quarter-century RIELTA has provided the Russian market with modern and high-quality equipment for the protection of residential, commercial, industrial, office, warehouse and other premises.

Nowadays «RIELTA» presents more than 250 product types of equipment:

- Security & intrusion detectors:
  PIR, Glass-break, Ultrasonic, Shock, Magnetic contacts
- Fire alarm detectors:
  Smoke, Flame, Lineal smoke, Hand-held
- Sound and light alarm annunciators
- Flood and temperature detectors
- Warning devices and counters
- Wireless product line

Multi-technology for counteracting gas-explosion attacks against ATMs

- Explosion-proof security and fire-alarm systems for hazardous areas protection
- Control panels
- Central monitoring station
- Power supplies
- Light-management and home-automation equipment
- Infrared detectors including pyroelectric and bolometer types
- Optical filters, etc.

RIELTA's success rests on essential pillars:

- complete development cycle - from idea to production
- professional team of highly skilled engineers, designers, technologists
- widely-developed experience
- modern technology & world-class manufacturing organization
- the best of measurement and test instrumentation
- 100% quality control during the manufacturing products process
- Quality Management System of the company meets ISO 9001:2015 requirements

Together, these enable quick and agile development of technically-sophisticated, leading-edge products at steadily-increasing production volumes.

Detectors

Summary table of passive infrared detectors

Name	Detection zone			Detection range, m	Operating temperature, °C	Power supply, V DC	IP rating	Tamper protection	Temperature compensation	Self-testing mode	Adjustment of sensitivity	Bracket in the set	Page	Features
	Wide-angle	Long range	Vertical curtain											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Wire loop														
Foton-9	+			10	-30…..+50	9…15	IP41	+	+		+		10	
Foton-9M	+			10	-30…..+50	9…15	IP41	+	+		+	+	10	
Foton-10	+			12	-30…..+50	9…15	IP41	+	+	+	+	+	11	
Foton-10A		+		20	-30…..+50	9…15	IP41	+	+	+	+	+	11	
Foton-10B			+	10	-30…..+50	9…15	IP41	+	+	+	+	+	11	
Foton-10M	+			12	-30…..+50	10…15	IP41	+	+	+		+	12	
Foton-10BM			+	10	-30…..+50	10…15	IP41	+	+	+		+	12	
Foton-10MD	+			12	-30…..+50	10…15	IP41	+		+		+	12	PET immunity up to 10 kg
Foton-10M-01	+			12	-30…..+50	10…15	IP41	+	+	+		+	13	Increased range of speed detection 0.1 -3 m/sec
Foton-12	+			12	-30…..+50	9…15	IP41	+	+			+	14	
Foton-12B			+	15	-30…..+50	9…15	IP41	+	+			+	14	
Foton-12-1	+			12	-30…..+50	8…30	IP41	+				+	15	Power supply via the loop
Foton-12-1B			+	15	-30…..+50	8…30	IP41	+				+	15	Power supply via the loop
Foton-15	+			12	-30…..+50	8…72	IP41	+				+	16	Power supply via the loop
Foton-15A		+		20	-30…..+50	8…72	IP41	+				+	16	Power supply via the loop
Foton-15B			+	10	-30…..+50	8…72	IP41	+				+	16	Power supply via the loop
Foton-16	+			12	-30…..+50	10…15	IP41	+	+	+	+	+	17	Anti-masking
Foton-16A		+		20	-30…..+50	10…15	IP41	+	+	+	+	+	17	Anti-masking
Foton-16B			+	15	-30…..+50	10…15	IP41	+	+	+	+	+	17	Anti-masking

Detectors

Detectors

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Foton-19	+			10	-30…..+50	10…15	IP41	+			+		18	PET immunity up to 20 kg
Foton-20	+			15	-30…..+50	10…15	IP41	+	+	+	+	+	19	
Foton-20B			+	15	-30…..+50	10…15	IP41	+	+	+	+	+	19	
Foton-21	+			ø9	-40…..+50	9…15	IP41	+	+	+	+		20	Ceiling mounting
Foton-22	+			20	-50…..+50	8…28	IP54	+	+	+	+	+	21	Tilt sensor built in
Foton-22B			+	20	-50…..+50	8…28	IP54	+	+	+	+	+	21	Tilt sensor built in
Foton-SH			+	5	-30…..+50	10…15	IP41	+	+			+	22	Vertical view PIR detector. Swivel bracket supplied
Foton-SH-1			+	5	-30…..+50	8…30	IP41	+	+			+	23	Power supply via the loop. Swivel bracket supplied
Foton-SH-2			+	5	-30…..+50	10…15	IP41	+	+				24	Vertical view PIR detector. Installed without bracket
Pyrone-4	+			12	-30…..+50	8…30	IP41				+		25	
Pyrone-4 vers.1	+			12	-30…..+50	8…30	IP41	+			+		25	
Pyrone-4 vers.2	+			18	-30…..+50	8…30	IP41	+			+		25	
Pyrone-4B			+	10	-30…..+50	8…30	IP41				+		25	
Pyrone-4D	+			10	-30…..+50	8…30	IP41				+		25	PET immunity up to 10 kg
Pyrone-5	+			10	-30…..+50	8…30	IP41				+		26	PET immunity up to 40 kg
Pyrone-6	+			10	-40…..+50	9…15	IP41	+			+		27	Ceiling mounting
Pyrone-SH			+	5	-30…..+50	8…30	IP41						30	Vertical view PIR detector. Installed without bracket
Pyrone-SH vers.3			+	5	-30…..+50	10…15	IP41	+	+		+		30	Sound alarm
Pyrone-8	+			12	-40…..+50	8…30	IP54	+	+		+	+	29	Outdoor
Pyrone-8B			+	12	-40…..+50	8…30	IP54	+	+		+	+	29	Outdoor
Wireless products														
Foton-12-RK	+			12	-20…..+50	2 batteries	IP41	+	+			+	96	
Foton-12B-RK			+	15	-20…..+50	2 batteries	IP41	+	+			+	96	
Foton-SH2-RK			+	5	-20…..+50	1 battery	IP41	+	+				98	Vertical view PIR detector. Installed without bracket
Pyrone-SH2-RK			+	5	-20…..+50	1 battery	IP41	+	+				98	
Foton-19RK	+			10	-20…..+50	2 batteries	IP41	+			+		97	PET immunity up to 40 kg
Pyrone-4-RK			+	10	-20…..+50	1 battery	IP41	+			+		95	PET immunity up to 20 kg
Pyrone-5RK			+	5	-20…..+50	1 battery	IP41	+			+		97	PET immunity up to 40 kg
Pyrone-8-RK	+			12	-40…..+50	2 batteries	IP54	+	+		+	+	99	Outdoor
Pyrone-8B-RK			+	12	-40…..+50	2 batteries	IP54	+	+		+	+	99	Outdoor

Detectors

Detectors

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Addressable detectors														
Foton-12-ADR	+			12	-30…..+50	Via addressable alarm loop	IP41	+	+			+	67	Transmission of signals via addressable alarm loop
Foton-12B-ADR			+	15	-30…..+50	Via addressable alarm loop	IP41	+	+			+	67	Transmission of signals via addressable alarm loop
Ladoga IKSS-A	+			12	-30…..+50	Via addressable alarm loop	IP41	+	+			+	67	Transmission of signals via addressable alarm loop, with additional wire loop
Foton-19ADR	+			10	-30…..+50	Via addressable alarm loop	IP41	+					69	Transmission of signals via addressable alarm loop, PET immunity up to 10 kg
Foton-SH-ADR			+	5	-30…..+50	Via addressable alarm loop	IP41	+	+			+	71	Transmission of signals via addressable alarm loop. Swivel bracket in assembly
Explosion-proof detectors														
Foton-18	+			12	-30…..+50	8…14	IP41	+	+			+	81	Explosion proof labeling 0ExiaIIBT6 X
Foton-18A		+		20	-30…..+50	8…14	IP41	+	+			+	81	Explosion proof labeling 0ExiaIIBT6 X
Foton-18B			+	15	-30…..+50	8…14	IP41	+	+			+	81	Explosion proof labeling 0ExiaIIBT6 X
Foton-18D	+			10	-30…..+50	8…14	IP41	+	+			+	81	Explosion proof labeling 0ExiaIIBT6 X, PET immunity up to 10 kg
Foton-SH-Ex			+	5	-30…..+50	8…14	IP41	+	+			+	82	Swivel bracket in assembly Explosion proof labeling 0ExiaIIBT6 X
Pyrone-1	+			20	-40…..+55	8…30	IP65	+	+		+	+	80	Supply via the loop Explosion proof labeling 0ExiaIICT6 X Two detection modes: "Open areas" – 12 m, "Closed premises" - 20 m
Pyrone-1A		+		20	-30…..+50	8…20	IP65	+				+	80	Supply via the loop Explosion proof labeling 1ExibIICT6 X Two detection modes: "Open areas" – 12 m, "Closed premises" - 20 m
Pyrone-1B			+	20	-30…..+50	8…20	IP65	+				+	80	Supply via the loop Explosion proof labeling 0ExiaIICT6 X Two detection modes: "Open areas" – 12 m, "Closed premises" - 20 m

Detectors

"Foton-9"
"Foton-9M"

Passive infrared detectors

Features:

- Wide angle
- Sabotage protection
- Digital temperature compensation
- Selectable sensitivity
- Tamper protection
- Swivel bracket supplied (Foton-9M)
- Alarm output: energized Form A (NC) relay

Specifications:

Detection range	10 m
Mounting height	2.3 m
Power supply, V DC	9…15 V
Current consumption, max	15 mA
Operating temperature:	-30…+50°C
IP rating	IP41
Dimensions	87x61x41 mm

See diagram fig.6

Passive infrared detectors

"Foton-10"

Features:

- "Foton-10"- wide angle
- "Foton-10A" - long range
- "Foton-10B"- vertical curtain
- Digital temperature compensation
- Alarm memory
- Tamper protection
- Swivel bracket supplied
- Alarm output: energized Form A (NC) relay

Specifications:

Detection range • Foton-10 • Foton -10A • Foton -10B	 12 m 20 m 10 m
Mounting height	2.3…3 m
Power supply, V DC	9…15 V
Current consumption, max	20 mA
Operating temperature	-30…+50°C
IP rating	IP41
Dimensions	126x70x55 mm

"Foton-10" - see diagram fig.2
"Foton-10A" - see diagram fig.10
"Foton-10B" - see diagram fig.12

"Foton-10M"

Passive infrared detectors

Features:

- "Foton-10M" – wide angle
- "Foton-10BM"- vertical curtain
- "Foton-10MD"- wide angle, PET immunity up to 20 kg
- Compact case
- Digital temperature compensation
- Alarm memory
- Tamper protection
- Swivel bracket supplied
- Alarm output: energized Form A (NC) relay

Specifications:

Detection range • Foton-10M, Foton-10MD • Foton-10BM	 12 m 10 m
Mounting height • Foton-10M, Foton-10MD • Foton-10BM	 2…5 m 2.3 m
Power supply, V DC	9…15 V
Current consumption, max	20 mA
Operating temperature	-30…+50°C
IP rating	IP41
Dimensions	90x60x50 mm

"Foton-10M" - see diagram fig.3
"Foton-10BM" - see diagram fig.13

"Foton-10M-01"

Passive infrared detector

Features:

- Speed detection from 0.1 to 3 m/sec
- Wide angle
- Compact case
- Digital temperature compensation
- Alarm memory
- Tamper protection
- Swivel bracket supplied
- Alarm output: energized Form A (NC) relay

Specifications:

Detection range	12 m
Mounting height	2…5 m
Power supply, V DC	10…15 V
Current consumption, max	20 mA
Operating temperature	-30…+50°C
IP rating	IP41
Dimensions	90x60x50 mm

"Foton-10M-01" - see diagram fig.3

"Foton-12"

Passive infrared detectors

Features:

- "Foton-12" - wide angle
- "Foton-12B"- vertical curtain
- Digital temperature compensation
- Tamper protection
- Swivel bracket supplied
- Alarm output: energized Form A (NC) relay

Specifications:

Detection range • Foton-12 • Foton-12B	 12 m 15 m
Mounting height • Foton-12 • Foton-12B	 2…5 m 2…3 m
Power supply, V DC	9…15 V
Current consumption, max	15 mA
Operating temperature	-30….+50°C
IP rating	IP41
Dimensions	92x57x48 mm

"Foton-12" - see diagram fig.5
"Foton-12B" - see diagram fig.14

Passive infrared detectors

"Foton-12-1"

Features:

- "Foton-12-1" - wide angle
- "Foton-12-1B" - vertical curtain
- Detector is powered via the loop
- Tamper protection
- Swivel bracket supplied
- Alarm signal is generated by increase of current consumption

Specifications:

Detection range • Foton-12-1 • Foton-12-1B	 12 m 15 m
Mounting height	2.3 m
Power supply, V DC	8…30 V
Current consumption • in standby mode, max • in "Alarm" mode	 0.1 mA from 2 mA to 15 mA
Operating temperature	-30…+50°C
IP rating	IP41
Dimensions	92x57x48 mm

"Foton-12-1" - see diagram fig.5
"Foton-12-1B" - see diagram fig.14

"Foton-15"

Passive infrared detectors

Features:

- "Foton-15" - wide angle
- "Foton-15A" - long range
- "Foton-15B" - vertical curtain
- Detector is powered via the loop
- Tamper protection
- Swivel bracket supplied
- Alarm output:
  - Short circuit mode (SC) – Alarm signal is generated by increase of current consumption
  - Open circuit mode (OC) - Alarm signal is generated by decrease of current consumption

Specifications:

Detection range • Foton-15 • Foton-15A • Foton-15B	 12 m 20 m 10 m
Mounting height	2.3 m
Power supply, V DC	8…72 V
Current consumption	
• in standby mode, max	0.1 mA
• in "Alarm" mode	from 2…15 mA
Operating temperature	-30…+50°C
IP rating	IP41
Dimensions	126x70x55 mm

"Foton-15" - see diagram fig.2
"Foton-15A" - see diagram fig.10
"Foton-15B" - see diagram fig.12

Passive infrared detectors with anti-masking

"Foton-16"

Anti-masking

Features:

- "Foton-16" - wide angle
- "Foton-16A" - long range
- "Foton-16B" - vertical curtain
- Detects PIR lens masking
- Digital temperature compensation
- Alarm memory
- Tamper protection
- Swivel bracket supplied
- Alarm output: energized Form A (NC) relay

Specifications:

Detection range • Foton-16 • Foton-16A • Foton-16B	 12 m 20 m 15 m
Mounting height	2.3 m
Power supply, V DC	9…15 V
Current consumption, max	30 mA
Operating temperature	-30…+50°C
IP rating	IP41
Dimensions	126x70x55 mm

"Foton-16" - see diagram fig.2
"Foton-16A" - see diagram fig.10
"Foton-16B" - see diagram fig.15

"Foton-19"

Passive infrared detector

up to 40 kg

Features:

- PET immunity up to 40 kg
- Adjustable sensitivity:
  - 10 kg mode (cats, decorative dogs) – maximum detection range 10 m
  - 20 kg mode (cats and small dogs) - maximum detection range 9 m
  - 40 kg mode (long-hair dogs) - maximum detection range 8 m
  - 40 kg mode (all breeds of dogs up to 40 kg) - maximum detection range 7 m
- Wide angle
- Tamper protection
- Alarm output: energized Form A (NC) relay

Specifications:

Detection range PET immunity up to 10 kg PET immunity up to 20 kg	10 m 8 m
Mounting height	2.3 m
Power supply, V DC	9…15 V
Current consumption, max	15 mA
Operating temperature	-30…+50°C
IP rating	IP41
Dimensions	105x75x56 mm

"Foton-19" - see diagram fig.4

"Foton-20"

Passive infrared detectors

Features:

- "Foton-20" - wide angle
- "Foton-20B" – vertical curtain
- Highly intellectual detector
- Modes adjustment:
  - testing mode
  - detection (15 and 10 m)
  - led indication
- Pyrodetector and amplifier testing every 24 hours
- Digital temperature compensation
- Alarm memory
- Tamper protection
- Swivel bracket supplied
- Alarm output: energized Form A (NC) relay

Specifications:

Detection range, max	**15 m**
Mounting height	2.3…3 m
Power supply, V DC	9…15 V
Current consumption, max	15 mA
Operating temperature	-30…+50°C
IP rating	IP41
Dimensions	92x57x48 mm

"Foton-20" - see diagram fig.5
"Foton-20B" - see diagram fig.14

“Foton-21”

Passive infrared detector

Features:

- Ceiling mounting
- Wide angle
- **Two dual element pyrodetectors**, unique lens, special algorithm of signal processing, detection of the intruder moving inside monitored area in any direction
- Self-testing mode
- Digital temperature compensation
- Alarm memory
- Tamper protection
- Alarm output: energized Form A (NC) relay

Specifications:

Detection zone diameter • at mounting height 2.5 m • at mounting height 5 m	 4.5 m 9 m
Detection angle: • horizontal • vertical	 360° 90°
Mounting height	2.5…5 m
Power supply, V DC	9…15 V
Current consumption, max	17 mA
Operating temperature	**-40…+50°C**
IP rating	IP41
Dimensions	Ø105x45 mm

“Foton-21” - see diagram fig.8

“Foton-22”

Passive infrared detectors

Features:

- Detectors for extreme operation conditions
- Foton-22 — wide angle;
- Foton-22B — vertical curtain
- Three dual element pyrodetectors in three independent detection channels provide high level of reliability and false alarms decrease
- IP rating (IP54) enables installing the detector in hasardous areas
- Adjustable detection range – 20 or 12 m
- Self-testing mode
- Digital temperature compensation
- Position changing control and tamper protektion
- Swivel bracket supplied
- Two control relays:
  - alarm output (NC) relay
  - failure output (NC) relay

Specifications:

Detection range, max	**20 m**
Mounting height	2…5 m
Power supply, V DC	8…28 V
Current consumption, max	30 mA
Operating temperature	**-50…+50°C**
IP rating	**IP54**
Dimensions	180x70x60 mm

“Foton-22” - see diagram fig.7
“Foton-22B” - see diagram fig.16

“Foton-SH”

Passive infrared detector

Features:

- Vertical curtain
- Digital temperature compensation
- Tamper protection
- Alarm memory
- Alarm output: energized Form A (NC) relay
- Swivel bracket supplied

Specifications:

Maximum mounting height	5 m
Detection angle	70°
Power supply, V DC	9…15 V
Current consumption, max	15 mA
Operating temperature	-30…+50°C
IP rating	IP41
Dimensions	91x52x56 mm

“Foton-SH” - see diagram fig.17

Passive infrared detector

“Foton-SH-1”

Features:

- **Power supply** via the loop
- Vertical curtain
- Generation of alarm signals by increase of current consumption
- Swivel bracket supplied

Specifications:

Maximum mounting height	5 m
Detection angle	70°
Power supply, V DC	8…30 V
Current consumption, max • in standby mode • in “Alarm” mode: • at power supply 8 V DC • at power supply 30 V DC	 0.3 mA from 1 to 3.2 mA from 2.6 to 13.2 mA
Operating temperature	-30…+50°C
IP rating	IP41
Dimensions	91x52x56 mm

“Foton-SH-1” - see diagram fig.17

"Foton-SH2"

Passive infrared detector

Features:

- Vertical curtain
- Possibility of installation above the doorway, as well as directly in the corners of window frames, door frames without any bracket
- Digital temperature compensation
- Tamper protection
- Alarm output: energized Form A (NC) relay

Specifications:

Maximum mounting height	5 m
Detection angle	90°
Power supply, V DC	9…15 V
Current consumption, max	10 mA
Operating temperature	-30…+50°C
IP rating	IP41
Dimensions	80x47x40 mm

"Foton-SH2" - see diagram fig.18

Passive infrared detectors

"Pyrone-4"

Features:

- "Pyrone-4" - wide angle
- "Pyrone-4" vers. 1, "Pyrone-4" vers. 2 - wide angle, tamper protektion
- "Pyrone-4B" - vertical curtain
- "Pyrone-4D" - wide angle with PET immunity up to 20 kg
- Alarm output: energized Form A (NC) relay

up to 20 kg

Specifications:

Detection range • Pyrone-4, Pyrone-4 vers. 1 • Pyrone-4B, "Pyrone-4D • "Pyrone-4" vers. 2	 12 m 10 m 18 m
Mounting height	2.3 m
Power supply, V DC	8…30 V
Current consumption, max	12 mA
Operating temperature	-30…+50°C
IP rating	IP41
Dimensions	90x60x50 mm

"Pyrone-4" vers. 1, "Pyrone-4" vers. 2 - see diagram fig.3
"Pyrone-4B" - see diagram fig.13
"Pyrone-4D" - see diagram fig.4

"Pyrone-5"

Passive infrared detector

up to 40 kg

Features:

- PET Immunity up to 40 kg
- Adjustable detectability:
  - 10 kg mode (cats, decorative dogs)
  - 20 kg mode (cats and short-wooled dogs)
  - 40 kg mode (long-hair dogs)
  - 40 kg mode (all breeds of dogs up to 40 kg)
  - Alarm output: energized Form A (NC) relay

Specifications:

Detection range, max	10 m
Mounting height	2.3 m
Power supply, V DC	8…30 V
Current consumption, max	15 mA
Operating temperature	-30…+50°C
IP rating	IP41
Dimensions	100x73x55 mm

"Pyrone-5" - see diagram fig.4

"Pyrone-6"

Ceiling mounting

Passive infrared detector

Features:

- Ceiling mounting security detector
- Wide angle
- **Two dual element pyrodetectors**, unique lens, special algorithm of signal processing, detection of the intruder moving inside monitored area in any direction
- Self-testing mode
- Digital temperature compensation
- Tamper protection
- Alarm output: energized Form A (NC) relay

Specifications:

Detection zone diameter • at mounting height 2.5 m • at mounting height 5 m	 4.5 m 9 m
Detection angle: • horizontally • vertically	 360° 90°
Mounting height	2.5…5 m
Power supply, V DC	9…15 V
Current consumption, max	17 mA
Operating temperature	**-40…+50°C**
IP rating	IP41
Dimensions	Ø105x45 mm

"Pyrone-6" - see diagram fig.8

"Pyrone-7"
"Pyrone-7D"

Combined PIR + Glass break detectors

Features:

- Two independent detection channels:
  - **Glass break** – detecting destruction of most types of construction glasses
  - **PIR** – detecting criminal intrusion into monitored area of enclosed premise
- Wide angle of PIR channel
- "Pyrone-7D" provides PET Immunity up to 20 kg
- Tamper protection
- LED indication of detection channels status, which could be switched off
- Adjustable sensitivity of Glass break channel
- Adjustable sensitivity of PIR channel
- Alarm memory
- Alarm output two NC relays:
  - Glass break channel
  - PIR channel
- Swivel bracket supplied

Specifications:

Detection range glass break channel	6 m
Detection range PIR channel: • "Pyrone-7" • "Pyrone-7D"	12 m 10 m
Minimum area of glass controlled by Glass-break channel	0.1 m^2
Power supply, V DC	10…15 V
Current consumption, max	35 mA
Operating temperature	-20…+45°C
IP rating	IP30
Dimensions	110x58x45 mm

"Pyrone-7" - see diagram fig.3, fig.20
"Pyrone-7D" - see diagram fig.4, fig.20

"Pyrone-8"

Outdoor passive infrared detectors

Features:

- "Pyrone-8" — wide angle
- "Pyrone-8B" — vertical curtain
- Designed for outdoor operation
- IP rating (IP54) enables installing detector in hazardous areas
- Three dual element pyrodetectors in three independent detection channels provide high level of reliability and decrease of false alarms
- Swivel bracket supplied
- Alarm output: energized Form A (NC) relay
- Tamper protection

Specifications:

Detection range	12 m
Power supply, V DC	9…30 V
Current consumption, max	30 mA
Operating temperature	**-40…+50°C**
IP rating	**IP54**
Dimensions	180x70x60 mm

"Pyrone-8" - see diagram fig.7
"Pyrone-8B" - see diagram fig.16

"Pyrone-SH"

Passive infrared detectors

Features:

- Vertical curtain
- Possibility of installation above the doorway, as well as directly in the corners of window frames, door frames without any bracket
- Alarm output: energized Form A (NC) relay

"Pyrone-SH" vers.3

Pyrone-SH vers.3 features:

- Designed for protection of paintings and other museum artefacts;
- Vertical curtain;
- Tamper protection;
- Sensitivity adjustment;
- Alarm message generation by the relay contacts opening;
- Sound alarm for drawing attention of museum attendants.

Specifications:

Maximum mounting height	5 m
Detection angle	90°
Power supply, V DC • Pyrone-SH • Pyrone-SH vers3	8…30 V 10…15 V
Current consumption, max	10 mA
Operating temperature	-30…+50°C
IP rating	IP41
Dimensions	80x47x42 mm

"Pyrone-SH" - see diagram fig.18

Combined PIR + TV detector

"Foton-17"

Features:

- Verification of an alarm by a TV signal
- Wide angle
- Built-in black / white video camera with resolution of 350 TV lines, minimum illumination 0.05 lux, maximum illumination 30,000 lux
- Activation of video camera for the preset interval (10, 30 or 120 sec) after generation of alarm signal
- Adjustable time of video camera operation
- Swivel bracket supplied
- Alarm output: energized Form A (NC) relay
- Tamper protection

Specifications:

Detection range	12 m
Power supply, V DC	10…15 V
Current consumption, max: • in standby mode • in "Alarm" mode with video camera switched on	 20 mA 150 mA
IP rating	IP30
Operating temperature	-30…+50° C
Dimensions	126x80x60 mm

"Foton-17" - see diagram fig.2

Detectors

"Pirs-1-1"
"Pirs-1-2"
"Pirs-1-2V"

Combined PIR + TV detectors

Features:

- Verification of an alarm by a TV signal
- Automatic camera switching upon receiving the signal via PIR channel
- Two operation modes of video camera:
  - Camera adjustment mode
  - Activation of camera for the preset interval (5.30 or 120 sec) upon receiving the signal via PIR channel
- Supply voltage control
- Operating temperature and PIR channel control
- Swivel bracket supplied
- Alarm output: energized Form A (NC) relay

"Pirs-1-3"

Specifications:

	Pirs-1-1	Pirs -1-2	Pirs -1-2V	Pirs -1-3
Detection range	12	12	12	20
Detection zone	wide angle	wide angle	wide angle	long range
Type of video camera	**black / white**	**color**	**color**	**black / white**
Lens	flattened cone	flattened cone	flattened cone	M12
Video camera resolution,	350	300	**480**	350
TVL	350	300	480	350
Minimum light sensitivity, lux	1	3.5	1	1

Power supply, V DC	10…13.2 V
Current consumption, max: • in standby mode • in "Alarm" mode with switched on video camera	 17 mA 150 mA
IP rating	IP30
Operating temperature	-10…+50° C
Dimensions	126x70x55 mm

"Pirs-1-1", "Pirs-1-2", "Pirs-1-2V" - see diagram fig.2
"Pirs-1-3" - see diagram fig.10

Detectors

Detectors

"Orlan"
"Orlan-SH"

Combined PIR + Glass break detectors

Features:

- "Orlan" - wide angle
- "Orlan-SH" - vertical curtain
- "Orlan-D" - wide angle with PET immunity up to 20 kg
- Two independent detection channels:
  - Glass break – detecting destruction of most types of construction glasses
  - PIR – detecting intrusion into monitored area
- Tamper protection
- LED indication of detection channels status
- Possibility of LED inolication disabling
- Selectable sensitivity of Glass break channel
- Selectable sensitivity of PIR channel ("Orlan")
- Two modes of PIR channel sensitivity ("Orlan-D"):
  - 10 kg mode (cats, decorative dogs)
  - 20 kg mode (cats and short-wooled dogs)
- Alarm memory
- Alarm output two NC relays:
  - Glass break channel
  - PIR channel
- Swivel bracket supplied

Specifications:

Detection range for Glass break channel • At minimum controlled area of 1.0 m^2 • At minimum controlled area of 0.1 m^2	 9 m 6 m
Detection range for PIR channel • Orlan • Orlan-SH • Orlan-D	 12 m 10 m 10 m
Power supply, V DC	10…15 V
Current consumption, max	35 mA
Operating temperature	-20…+45°C
IP rating	IP30
Dimensions • Orlan, Orlan-SH • Orlan-D	 110x58x45 mm 126x70x55 mm

"Orlan" - see diagram fig.2; fig.20
"Orlan-SH" - see diagram fig.12; fig.20
"Orlan-D" - see diagram fig.4; fig.20

"Orlan-D"

up to 20 kg
"Orlan-D"

Detectors

Detectors

"Orlan-2"

Ceiling mounting

Combined PIR + Glass break detector

Features:

- **Ceiling mounting** security detector
- Two independent detection channels:
- **Glass break** – detecting destruction most of types of construction glasses
- **PIR** – detecting intrusion into monitored area
- **Two dual element pyrodetectors**, unique lens, special algorithm of signal processing, detection of the intruder moving inside monitored area in any direction
- Digital temperature compensation
- Tamper protection
- Failure monitoring
- LED indication of detection channels status
- Possibility of LED inolication disabling
- Adjustable sensitivity for Glass break and PIR channels
- Alarm memory
- Alarm output two NC relays:

- Glass break channel
- PIR channel

Specifications:

Detection range for Glass break channel	6 m
Detection zone diameter of PIR channel at mounting height of 5 m	9 m
Detection angle: • horizontal • vertical	 360° 90°
Minimum area of controlled glass	0,1 m^2
Power supply, V DC	9…15 V
Current consumption, max	35 mA
Operating temperature	-20…+45°C
IP rating	IP30
Dimensions	Ø105×48 mm

"Orlan-2" - see diagrams fig.8; fig.19

Detectors

“Steklo-2”

Glass break detector

Features:

- Detecting destruction of the following types of construction glasses: common, quenched, patterned, armored, multilayer and protected with polymer tape (laminated), glass hollow blocks
- Detector is powered via the loop
- Adjustable sensitivity
- Testing mode
- Generation of alarm signals by increase of current consumption

Specifications:

Detection range	6 m
Minimum controlled glass area	0,1 m^2
Power supply, V DC	15…30 V
Current consumption in standby mode, max	1 mA
Operating temperature	-20…+45°C
IP rating	IP30
Dimensions	80x80x35 mm

“Steklo-2” - see diagram fig.19

Glass break detector

“Steklo-3”

Features:

- Detecting destruction of the following types of construction glasses: common, quenched, patterned, armored, multilayer and protected with polymer tape (laminated), glass hollow blocks, as well as standard double- and triple-chamber windows
- Adjustable sensitivity
- Tamper protection
- Testing mode
- Alarm memory
- Alarm output: energized Form A (NC) relay

Specifications:

Detection range • At minimum controlled area of 1.0 m^2 • At minimum controlled area of 0.1 m^2	 9 m 6 m
Power supply, V DC	9…17 V
Current consumption, max	22 mA
Operating temperature	-20…+45°C
IP rating	IP30
Dimensions	65x65x30 mm

“Steklo-3” - see diagram fig.19

"Steklo-3M"

Glass break detector

Features:

- Detecting destruction of any types of construction glasses: common, quenched, patterned, armored, multilayer and protected with polymer tape (laminated), glass hollow blocks, as well as standard double- and triple-chamber windows
- Adjustable sensitivity
- Tamper protection
- Testing mode
- Alarm memory
- Alarm output: energized Form A (NC) relay

Specifications:

Detection range • At minimum controlled area of 1.0 m^2 • At minimum controlled area of 0.1 m^2	 9 m 6 m
Power supply, V DC	9…17 V
Current consumption, max	22 mA
Operating temperature	-20…+45°C
IP rating	IP30
Dimensions	80x47x29 mm

"Steklo-3M" - see diagram fig.19

Glass break detector

"Steklo-4"

Anti-masking

Features:

- Detecting masking of detector
- Detecting destruction of the following types of construction glasses: common, quenched, patterned, armored, multilayer and protected with polymer tape (laminated), glass hollow blocks, as well as standard double- and triple-chamber windows
- Adjustable sensitivity
- Tamper protection
- Testing mode
- Alarm memory
- Alarm output: energized Form A (NC) relay

Specifications:

Detection range	6 m
Minimum controlled glass area	0,1 m^2
Power supply, V DC	9…17 V
Current consumption, max	22 mA
Operating temperature	-20…+45°C
IP rating	IP30
Dimensions	80x47x29 mm

"Steklo-4" - see diagram fig.19

"Zvon-1"

Glass break detector

Features:

- "Zvon-1" vers.1 — tamper protection
- Detecting destruction of the following types of construction glasses: common, quenched, patterned, armored, multilayer and protected with polymer tape (laminated), glass hollow blocks, as well as standard double and triple-chamber windows
- Adjustable sensitivity
- Alarm output: energized Form A (NC) relay

Specifications:

Detection range	• "Zvon-1" • "Zvon-1" vers.1	6 m 10 m
Minimum controlled glass area	• "Zvon-1" • "Zvon-1" vers.1	0.1 m^2 1.0 m^2
Power supply, V DC		9…17 V
Current consumption, max		18 mA
Operating temperature		-20…+45°C
IP rating		IP30
Dimensions		80x47x29 mm

"Zvon-1" - see diagram fig.19

"Vitrina"

Active volume ultrasonic detector

The detector consists of:
- signal processing unit (SPU)
- sound emitting device (SED)
- sound receiving device (SRD)

Features:

- Detecting intrusion into protected glass-cases (volume), as well as objects movement inside the protected volume
- Adjustable sensitivity
- Monitoring of disconnection and masking of sound receiving device (SRD) and sound emitting device (SED)
- Indication of detector operation modes and interferences inside the monitored volume
- Tamper protection of SPU
- Alarm output: energized Form A (NC) relay

Specifications:

Minimum/maximum monitored volume	0.03/1.0 m^3
Power supply, V DC	10.2…15 V
Current consumption, max	50 mA
Operating temperature	+5…+40°C
IP rating	IP30
Dimensions • SPU • SED, SRD	 123x58x26 mm 40x30x20 mm

"Shorokh-2"

Seismic vibration detector

Features:

- Designed to detect attempts to destroy concrete walls and floors, brick walls, wooden structures, plywood, timber constructions, standard metal safes, metal cabinets and ATMs
- Wide range of detectable attacks, such as thermic lance, acetylene torch, drilling, diamond drill, electric cutting, hammers, chisels, explosion, etc.
- Automatically selected algorithm of operation according to the attack types
- Indication of detector state and interference vibrations of monitored structure
- LED indication modes control
- Three testing modes for sensitivity adjustment
- Alarm memory
- Tamper protection
- Alarm output: energized Form A (NC) relay

Specifications:

Vibration sensitivity	0.1-1.6 m/sec^2
Power supply, V DC	9…17 V
Current consumption, max	25 mA
Operating temperature	-30…+50°C
IP rating	IP41
Dimensions	101x43x33 mm

Seismic vibration detector

"Shorokh-2-10"

Features:

- Designed to detect attempts to destroy concrete walls and floors, brick walls, wooden structures, plywood, timber constructions, standard metal safes, metal cabinets and ATMs
- Wide range of detectable attacks, such as thermic lance, acetylene torch, drilling, diamond drill, electric cutting, hammers, chisels, explosion, etc.
- Monitoring of several (up to 10) sensors by one signal processor unit (SPU)
- Power supply and signal transmission from detectors via the same two-wired loop up to 70 m long. Possible parallel connection of separate segments of the loop
- Detection, indication and memory of:
  - two-wired loop failure,
  - case tampering,
  - disconnecting the sensors,
  - decrease of power supply
- Alarm output: energized Form A (NC) SPU relay

Specifications:

Vibration sensitivity	0.1-1.6 m/sec^2
Power supply, V DC	9…17 V
Current consumption, max	50 mA
Operating temperature	-30…+50°C
IP rating	IP30

"Shorokh-3"

Dual Technology Seismic Vibration & Tilt Detector

Features:

- Detects attempts of break-in and theft of ATMs, safes and other bank protection equipment
- Controls the changing of the detectors tilt relative to its initial position
- Identifies a wide range of detectable attacks, such as thermic lance, acetylene torch, electrically-operated and hand-guided impact, non-impact and circular tool, cutting and grinding tool, explosion, etc.
- Automatically selects algorithm according to the type of attack tools
- Provides wall and case tamper protection
- Alarm output: energized Form A two NC relays
- Ensures sabotage protection
- PC-configuring

Specifications:

Vibration sensitivity	0.1…1.6 m/sec^2
Sensitivity to tilt angle	5°
Power supply, V DC	9…17 V
Current consumption, max	25 mA
Operating temperature	-30…+50°C
IP rating	IP41
Dimensions	101x43x33 mm

"Shorokh-3V"

Triple Technology Seismic Vibration & Tilt & Gas Detector

Features:

- Detects attempts of break-in and theft of ATMs, safes and other valuables protection equipment
- Controls changing of the detectors tilt relative to its initial position
- Identifies a wide range of detectable attacks, such as thermic lance, acetylene torch, electrically-operated and hand-guided impact, non-impact and circular tool, cutting and grinding tool, explosion, etc.
- Detects flammable gases
- Armed with semiconductive sensing element with an extended service life
- Provides wall and case tamper protection
- Alarm output: energized Form A (NC) relay
- Ensures sabotage protection
- PC-configuring

Specifications:

Detected concentration of flammable gases (propane, methane, hydrogen, etc.)	10% of LEL* (for propane)
Vibration sensitivity	0.1…1.6 m/sec^2
Sensitivity to tilt angle	5°
Power supply, V DC	9…17 V
Operating temperature	0…+50°C
IP rating	IP20
Dimensions	101x43x33 mm

* LEL – the lower explosion limit

"Udar"

Seismic vibration detector

Features:

- Detects destruction of different construction structures: concrete walls and floors, brick walls, wooden structures, plywood, timber constructions, standart metal safes, metal cabinets and ATMs
- Identifies a wide range of detectable attacks, such as thermic lance, acetylene torch, drilling, diamond drill, electric cutting, hammers, chisels, explosion, etc.
- Automatically selects algorithm according to the type of attack tools
- Indicates detector status and vibration level of monitored structure
- Selectable LED indication modes
- Alarm output: energized Form A (NC) relay

Specifications:

Vibration sensitivity	0.1-1.6 m/sec^2
Power supply, V DC	8…17 V
Current consumption, max	25 mA
Operating temperature	-30…+50°C
IP rating	IP41
Dimensions	101x43x33 mm

"Passenger Count Sensor "SH2"

Designed for registration people passing through the detection zone. The sensor is installed above the entrance into the vehicle, premise or any other controlled zone.
"SH-2" operates as a component of a system providing passenger traffic monitoring.

Features:

- Registration is fulfilled by the control relay contacts (C "NC") opening for a time of at least 0.8 s
- Mounting height up to 3 m
- Sensor base has four mounting planes
- High level of EMI immunity

Specifications:

Detection angle	90°
Power supply, V DC	8…28 V
Current consumption	12 mA
Operating temperature	-30…+50°C
IP rating	IP41
Dimensions:	80x47x40 mm

Passenger count sensor - *see diagram fig.19*

External Temperature Sensor

Features:

Designed for temperature control.
External temperature sensor is connected to the detector "Celsius-RK" or other devices receiving messages in "1-wire" protocol.

Specifications:

Operating temperature	-55…+125°C
IP rating	IP65

“STZ”

Flood Detector

Features:

- Used to detect water leaks from water and heating supply networks of premises at individual and multi-storey buildings, in boiler houses etc. Classified as a device for detection man-triggered hazards
- Installed inside closed premises. Alarm output: energized Form A (NC) SPU relay with activation of sound announcer. Used as an independent device or as a component of a security alarm system
- Detector consists of signal processing unit (SPU) and sensitive elements (SE) from 1 to 3 pcs. Every SE is connected to SPU by a separate two-wire loop up to 15 m in length
- Detectors may be mounted on the floor or on the wall
- Immunity to touching with the wet item (cloth, etc.)

Specifications:

Flood detection, water layer height, min		1 mm
Power supply, V DC		8…14 V
Current consumption, max		20 mA
Operating temperature		0…+50°C
IP rating		IP30
Dimensions:	- SPU - SE	80x80x31 mm 35x15x15 mm
Weight:	- SPU - SE	0,07 kg 0,03 kg

Flood Detectors

“DZ-12V”
“DZ-4”

Features:

- Designed to detect water leaks from water and heating supply networks of premises in individual and multi-storey buildings, boiler houses etc. Classified as a device for man-triggered hazards detection
- Compatible with any control panel
- Floor or wall installation
- Power supply and message transmission via two-wire alarm loop (DZ-12V)
- Flood alarm output: energized Form A (NC) relay (DZ-4)

Specifications:

Flood detection, water layer height	1 mm and more
Operating temperature	-20…+50°C
IP rating	IP67
Dimensions	65x22x16 mm
Detector weight	0,05 kg
Cable length	1,5 m

DZ-12V	
Power supply, V DC	8…30 V
Current consumption at voltage supply 15V, not more than	3μA
Current consumption at voltage supply 30V, not more than	10μA
Current consumption in “ALARM” mode, not less than	3.5 mA

DZ-4	
Power supply, V DC	4…30 V
Current consumption	not more than 7 mA

"Udar-STG"

Flammable gas detector

Designed for detection of flammable gases (methane, propane, etc.) dangerous concentration, for generation of alarm signal and activation of explosion-counteracting system.
The main appliance of "Udar-STG" is protection of ATMs, self-service machines, safes, etc. from gas-explosion attacks, that are executed by introducing flammable gas-air mixture of domestic gases and its subsequent ignition.

Features:

- High interference immunity
- Discrete sensitivity adjustment
- Semiconductive sensing element with an extended service life
- Low power consumption

Specifications:

Detectable concentration of flammable gases (propane, methane, hydrogen, etc.) depending on the position of the jumper "SENS"	10% LEL* of propane 20% LEL of propane
Power supply V DC	9…17 V
Current consumed by the detector in standby mode and in "Alarm" mode, not more than	60 mA
Maximum load current for contacts "+OUT-"	not more than 700 mA
IP rating	IP30
Operating temperature	0…+50 °C
Dimensions, not more than	112x41x32 мм
Average service life, not less than	5 years

* LEL – the lower concentration threshold

"Udar-KB"

Explosion-counteracting System

Explosion-counteracting system "UDAR-KB" is designed for prevention of gas-explosion attacks against ATMs and self-service machines. Such attacks are undertaken by introducing domestic gases into ATM with following ignition of the gas-air mixture

Features:

- Initial detection of pre-explosive concentration of dangerous flammable gases inside secured object with lower explosion limit (LEL) of 10%
- Alarm output: energized Form A (NC) alarm relay
- Counteraction of gas-air mixture explosion by filling the internal space of the secured object with a phlegmatizing agent

Composition of the system:

- Flammable gas detector "Udar-STG"
- Phlegmatizing unit in assembly
- Magnetic contact for door control

"Udar-KB" versions depending on the secured object volumes:

Version	Secured object volume, l	Tank volume, l
Udar-KB-1	up to150	1
Udar-KB-2	150-300	2
Udar-KB-5	300-500	5
Udar-KB-2-1	150-300	1+1

Power Supply Unit

“MIP-R-1” Backup Power Supply Unit

Features:

- Designed to provide backup power supply 1 A 12 V DC for the security and fire alarm systems

Provides:

- Protection against load current exceedance and short-circuit with restoration of output voltage after overload is eliminated
- Protection against battery deep discharge
- Output voltage LED indication of AC network supply or backup power supply
- Generation of the following information messages to relay output:
  - power supply switch-off (automatically backup power supply switch-on)
  - discharge of battery if voltage on terminals is less than 11 V
  - failure of battery
  - failure of supply output
  - tamper alarm output

Specifications:

Maximum power consumed from AC network at maximum load current	30 VA
Power supply V AC	187…242V
Output current	1.0 A
Maximum output current (during not more than 30 min)	1.2 A
Output voltage	12 ± 0.6 V
Output voltage pulsation (amplitude value), max	30 mV
Battery capacity	7 Ah
IP rating	IP30
Operating temperature (without regard of accepted battery temperature)	-30…+50° C
Dimensions	220x185x75 mm
Weight, max: • without battery • with installed battery	1.7 kg 3.7 kg

Power Supply Unit

“Ladoga BP-A”

Addressable backup power supply unit

Application

Supplies power to control panels with nominal voltage 12 V DC

Features:

- Stabilized pulse-type power supply unit with galvanized junction of output voltage from AC supply network
- Microprocessor control
- Remote control of operation mode via communication bus with control panel “Ladoga-A”
- Two separate supply outputs
- Thermally compensated battery charge
- Battery with capacity from 7 to 18 Ah in can be installed in case

Provides:

- Automatic transfer from “AC” mode to battery supply and back
- LED indication of operation mode
- Transfer messages: address, status messages of operation mode and “Tamper open ” via communication bus to control panel “Ladoga-A”
- Four units BP-A may be connected to one communication bus of “Ladoga–A”
- Thermally compensated charge of battery, temperature, charge current and voltage control
- Protection of supply outputs against failure in load circuits (current overload, short circuit)
- Automatic restoration of output voltage after elimination of cause of fault in load circuits
- Battery circuit control
- Protecting of battery switch off if a failure is detected: open circuit, short circuit, incorrect connection of battery («reverse polarity»), connection of deeply discharged battery with voltage less than 9 V (without load)
- Automatic connection of battery after elimination of failure
- Protection of battery from deep discharge

Specifications:

Power supply V AC	160…250 V
Output	(13.2±0.4)V DC
Output voltage pulsation (peak to peak), max	not more than 30 mV
Nominal output currents	1A (output 1), 2A (output 2)
Output voltage when power supply is provided from battery (back-up mode)	from 10 up to 13V
Battery charge current, max	not more than 1.1 A
Battery discharge, max	not more than 3.3 A
Shutdown threshold of battery against the deep discharge	10.6 V
Battery type	sealed unwatched lead-acid battery with nominal voltage 12 V, recommended capacity-up to 65 A/h
Operating temperature	-10…+40°C

Control panel

“Ladoga-A” Addressable control panel

Features:

- Provides control 8-80 zones of different types.
- Operates with 32 independent areas.
- Up to 33 programmable event driven relay outputs.
- Two-wired addressable loop up to 500m long.
- Restoring of addressable loop after short circuit.
- Possibility to connect different types of addressable detectors to addressable loop
- Possibility to connect to additional wire loop any types of detectors.
- Control panel comprises separate modules connected via two-wired communication bus.
- Two-wired communication bus with lenght up to 1000 m long in lenght.
- Case tamper protection
- Energy-independent system log for 2000 events. Records may be sorted and displayed
- Software programmed and monitored

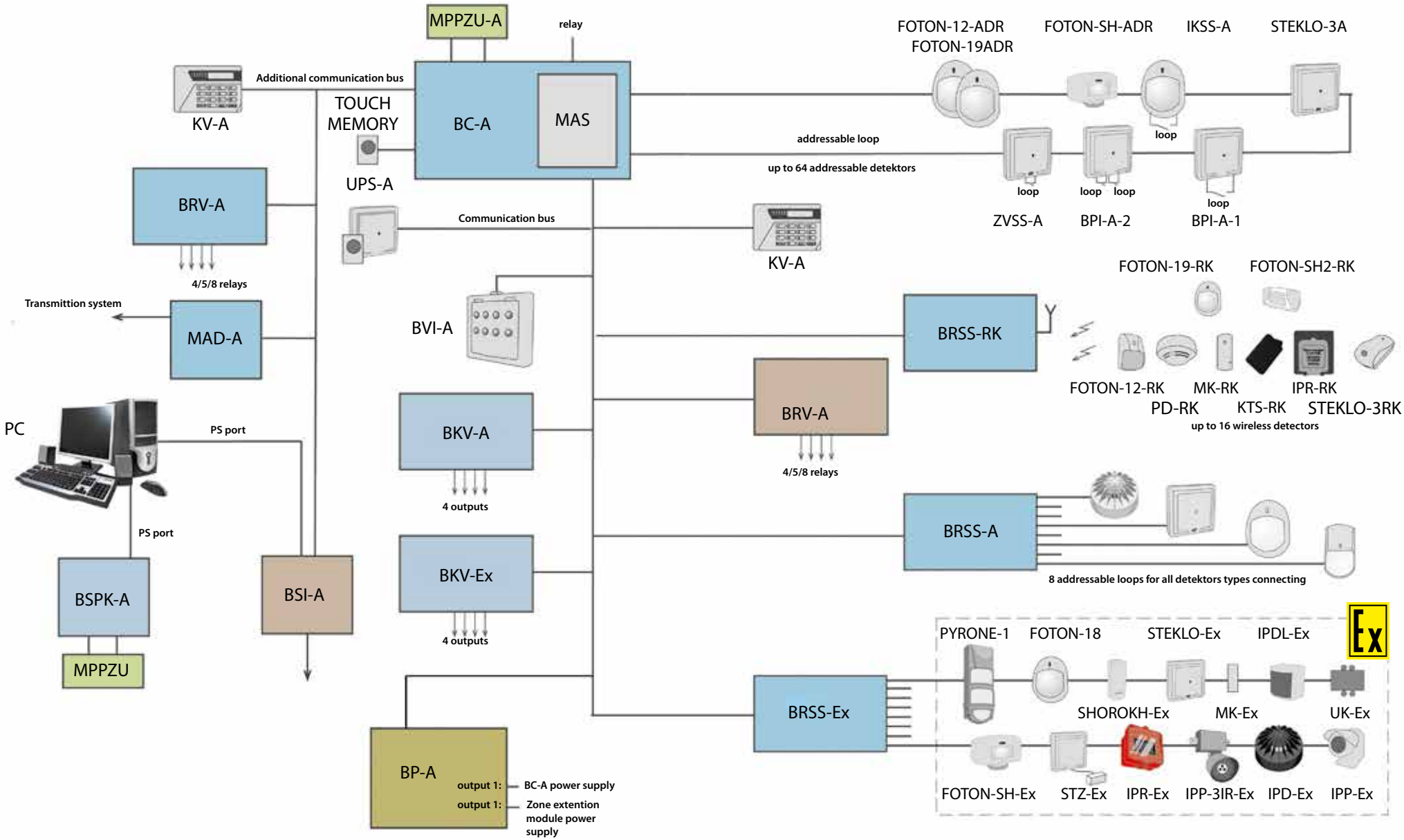
Specifications:

Number of zones	80
- with MAS	up to 64 addressable zones up to 16 wire loops
- without MAS	up to 80 wireless zones up to 80 wire loops
Maximum communication bus lenth	1000 m
Maximum adressable loop lenth	500 m
Number of relays with switchable contacts: - without BRV-A - with four BRV-A	 3 35
Power supply range	10.5-14V DC
Number of areas	32
Loops	– addressable loop; – wireless loop – loop with EOL; – supervised EOL; – loop with two EOLs
Access levels	– installer; – administrator; – user
System log	2000 events (ring-type)
Number of user passwords	100

Control panel

Control panel

The module scheme of control panel "Ladoga-A"



Control panel

Central module "Ladoga BC-A"

Ladoga BC-A receives messages, controls zone extension modules, monitors status of addressable loop, keeps system log, controls built-in relay, arranges transmitting of alarm messages to central station. Equipped with built-in energy-independent real time clock

Remote keypad "Ladoga KV-A"

Displays information about control panel status, provides panel configuration, displays event log

Arming / Disarming module "Ladoga UPS-A"

Designed for arming and disarming of the control panel "Ladoga-A" by means of readers by the "Touch Memory"

Addressable loop module "Ladoga MAS"

Monitors and controls the status of addressable detectors
Located in the central module case
Provides:
- up to 64 addressable detectors connection;
- power supply of addressable detectors;
- protection of addressable loop against short circuit (SC)

Zone extension module "Ladoga BRSS-A"

Provides 8 additional wire loops.
3 versions: BRSS-A – metal case, BRSS-A vers.1 - without case, BRSS-A vers.3 –plastic case

"BRSS-A" loop's features:
- impedance in Normal mode – from 4.2 to 11 kΩ;
- loop voltage with EOL resisitor – from 18 to 22V DC;
- SC current – not more than 20 mA;
- response time – 500 msec.

Wireless zone extention module "Ladoga BRSS-RK"

Designed to provide the status control and operation modes management of the 16 wireless security and fire alarm detectors via the wireless two-way communication and transmittion of the received information to the central module via connection bus
Up to 5 BRSS-RK can be connected to the central module

For detailed description of wireless system see page 94

Indication module “Ladoga BVI-A”

Displays status of 8 areas of the device (4 different statuses for each area)
Up to 4 mimic modules per one “Ladoga A” panel
Sound enable/disable
LEDs clearly visible from any angle of view or at any illumination
Clear perception of LED indication even at deviation of view angle and in terms of illumination with direct sun rays

Relay module “Ladoga BRV-A”

Provides additional relay outputs.
Two versions depending on the number of relay outputs:

- version 1: 4 relays with switchable contacts, metal case
- version 2: 8 relays with switchable contacts, metal case
- version 3: 8 relays with switchable contacts, without case
- version 4: 5 relays with switchable contacts, plastic case

Relay parameters:

- max 14V DC at 3.0 A;
- max 30 mA at 72V DC

Interface module “Ladoga BSPK-A”

Provides interface transfer of configuration and event log from the unit to PC with the use flash memory “Ladoga MPPZU-A” (electronic floppy disc)
Flash memory “Ladoga MPPZU”
Designed to transfer configuration and event log data from control panel
“Ladoga-A” to computer and vice versa

Outputs control module “Ladoga BKV-A”

Designed to supervise executive modules by command impulses with nominal voltage 12 V and current not more than 1 A. The executive modules via two wired connection lines with automatic control of their status, failures and shortcuts. Two versions: BKV-A – plastic case, BKV vers.1 – metal case
Tamper protection

Specifications:

Power supply	10.5…14 V
Number of controlled relays	4
Power consumption, max (the output loading is not taken into account): • stand-by mode • start mode of the executive module	 20 mA 80 mA
Maximal permissible commutation voltage on the control outputs, max	14 V
Maximal permissible current commutated by each control output, max	1A
Addresses range	from 1 up to 8
Operation temperature	-30…+50°C

Interface module “Ladoga BSI-A”

BSI-A designed to:

- send to PC status messages;
- send the commands from PC to control panel “Ladoga-A”;
- provide an opportunity of up to four BC-A modules connection (by means of the extention module MRK PCB)

Automatic dialer “Ladoga MAD-A”

MAD-A provides digital messages transmitting to the peripherals by the Ademco Contact ID protocol
Control panel “Ladoga-A” provides connection of two autodialers MAD-A (operation in the mode of dual-line automatic dialer)

Back-up power supply unit “Ladoga BP-A”

Designed for providing power supply to control panel Ladoga-A and other fire alarm devices, which need back-up power supply with nominal voltage 12 V DC.
Features:

- Microprocessor based operation control
- Microprocessor based efficiency test control
- Up to four BP-A may be connected to communication bus of Ladoga -A
- Remote control of status and main devices parameters: efficiency, operation mode, output voltages, load currents, full/low battery
- Temperature-compensated battery charge

See the detailed information on page 56

Addressable PIR “Foton-12-ADR” “Foton-12B-ADR” “Ladoga IKSS-A”

Detect intrusion into protected area of closed premises and monitoring wire loop (only Ladoga IKSS-A)

Specifications:

Detction range:	• “Foton-12-ADR”,“IKSS-A”, max • “Foton-12B-ADR, max	12 m 15 m
Operating temperature		-30…+50°C
Dimensions		100×73×55 mm

“Ladoga IKSS-A” controls an additional loop’s state by its resistance. The loop has unique address in the system

“Foton-12-ADR”, “Ladoga IKSS-A” – see diagram fig.2
“Foton-12B-ADR” – see diagram fig.15

Protective device

Designed for subdivision to 4 separate groups of the following lines: addressable loop, communication bus, power supply. Provides protection against short circuit .

Control panel

Addressable detector connecting unit “Ladoga BPI-A-1” “Ladoga BPI-A-2”

Designed to increase the number of wire loops of the product. BPI is sending messages about the status of addressable alarm loop to MAS by the “Rielta Contact-A” protocol

There are two versions of BPI:

- “Ladoga BPI-A-1” – increases the number of alarm loops for one;
- “Ladoga BPI-A-2” – increases the number of alarm loops for two.

“Ladoga BPI-A-1” controls loop status by its resistance

“Ladoga BPI-A-2” controls two loop’s status by their resistance. The loop has unique address in the system.

Types of detectors that can be included in alarm loop are:

- Magnetic contacts;
- Contact detectors;
- Detectors with the relay output or micro-switch contact output for example fire heat detectors.

Power supply provided via addressable alarm loop.

Tamper protection

Specifications:

Current consumption in “Norm” mode: “Ladoga BPI-A-1”, max “Ladoga BPI-A-2”, max	1.5 mA 2.5 mA
Addresses range	from 1 to 64
Informativity, min	6
Operation temperature	-30…+50°C
Dimensions	80×80×31 mm

Addressable passive infrared detector “Foton-19ADR”

Designed to provide detection of intrusion into protected area and sending messages via addressable alarm loop to MAS by the “Rielta Contact-A” protocol.

Provides pet immunity up to 10 kg (cat, fancy breed dog)

Features:

- Microprocessor signal analysis;
- Power supply via the power supply loops BRSS-Ex;
- Alarm: energized form A (NC) alarm relay

up to 10 kg

Specifications:

Detection range, max	12 m
Current consumption, min	1.6 mA
Warm up time, max	10 sec
Addresses range	from 1 up to 64
Operation temperature	-30…+50°C
Dimensions	102×73×55 mm

“Foton-19ADR” – see diagram fig. 4

Control panel

Addressable glass break detectors “Steklo-3A” “Ladoga ZVSS-A”

Designed to detect destructions of any types of construction glasses: common, quenched, patterned, armored, multilayer and protected with polymer tape (laminated), hollow glass blocks, installed in building constructions (openings) and elements of closed premises interior followed by transfer of message about addressable alarm loop status via addressable alarm loop by the “RIELTA Contact-A” protocol

Specifications:

Maximal detection range, max	6 m
Thickness of the protected glass	from 2.5 up to 8 mm
Operation temperature	-20…+40° C
Dimensions	80×80×31 mm

“Steklo-3A” – see diagram fig. 19

Addressable passive infrared detector “Foton-SH-ADR”

Designed to detect intrusion into the protected area through doorways and window frames and sending alarm messages via addressable alarm loop to MAS by the “Rielta Contact-A” protocol. Vertical curtain

Specifications:

Mounting height	5 m
Current consumption, max	1.6 mA
Warm up time, max	10 sec
Addresses range	from 1 up to 64
Operation temperature	-30…+50°C
Dimensions	91×52×56 mm

“Foton-SH-ADR” – see diagram fig. 17

Explosion-proof systems

"Ladoga-Ex"

Explosion-proof fire and security system for hazardous areas protection

Designed for application as a fire-alarm system in hazardous areas

Zone extension module "BRSS-Ex"

"BRSS-Ex" is designed to receive alarm messages delivered from the detectors that are installed in hazardous areas as well as to provide their power supply. "BRSS-Ex" is an explosion-proof barrier, it is installed outside of hazardous area.
Depending on the version, "BRSS-Ex" is able to transmit information about intrinsically safe loops as follows:

- to "Ladoga-A" control panel;
- to any control panel by means of relay module "Ladoga BRV-A" vers. 2;
- to any control panel by transmitting loop resistance from connected intrinsically safe loops in hazardous area to output circuits outside of hazardous area.

Specifications:

	Intrinsically safe alarm loops quantity	Intrinsically safe power supply units quantity (100 mA for each output)	Explosion-proof labeling	IP rating	Operating temperature	Outputs types
BRSS-Ex	8	2	**[Exia]IIC X**	IP20	minus 40…+55°C	via "BRV-A" vers.2
BRSS-Ex vers.1	8	5	**[Exia]IIC X**	IP20	minus 40…+55°C	via "BRV-A" vers.2
BRSS-Ex vers.2	2	2	**[Exia]IIC X**	IP65	minus 40…+55°C	loop resistance transmission

Outputs control module "BKV-Ex"

"BKV-Ex" is designed to provide control of executive modules, light and sound annunciators with nominal voltage 12V and current not more than 150mA, which require intrinsically safe power supply and loop failure control and which are installed inside closed hazardous areas.

- Number of controlled outputs - 4
- Supervision is fulfilled via two-wire addressable communication bus hooked up to control panels "Ladoga-A", "Yauza-Ex" or "Yauza-PU-Ex"

Specifications:

Explosion-proof labeling	**[Exia]IIC X**
Consumption current, not more than	1000 mA
IP rating	IP65
Operating temperature	minus 40…+55°C
Dimensions	290x180x60 mm

Explosion-proof systems

Explosion-proof systems

Infrared Flame Detector “IPP-3IR-Ex”

“IPP-3IR-Ex” is designed to detect ignitions accompanied by open flame in hazardous areas.

- Three spectral lines analysis in IR band provides fast and reliable flame detection and high-level interference protection
- Three-level sensitivity adjustment for specified operation conditions
- Self-testing of internal circuitry operability
- Heating of sensing elements
- Possibility of outdoor installation

Specifications:

Explosion-proof labeling	**0ExiaIICT6 X**
Detection angle	80°
Detection range, not less than	25 m
Consumption current, not more than	20 mA (120 mA with heating)
IP rating	IP65
Operating temperature	minus 50…+55°C

Multirange Flame Detector “IPP-IR-UV-Ex”

“IPP-IR-UV-Ex” is designed to detect ignitions accompanied by open flame in hazardous areas.

- Two spectral lines analysis in the IR and UV bands provides fast and reliable flame detection as well as high interference protection
- Choice of detection mode:
  - just one UV,
  - IR+UV (2 levels of IR-sensitivity)
- Self-testing of internal circuitry operability
- Possibility of outdoor installation

Specifications:

Explosion-proof labeling	**0ExiaIICT6 X**
Detection angle	90°
Detection range, not less than	25 m
Consumption current, not more than	25 mA
IP rating	IP65
Operating temperature	minus 40…+55°C

Explosion-proof systems

Smoke Point Detector "IPD-Ex"

"IPD-Ex" is designed to detect ignitions accompanied by smoke in closed hazardous areas.

Specifications:

Explosion-proof labeling	**0ExiaIICT6 X**
Sensitivity	0.05…0.2 dB/m
Consumption current, not more than	100 µA
Alarm message	by consumption current step-up
IP rating	IP30
Operating temperature	minus 30…+55°C

Rate-of-Rise Thermal Detector "IPT-Ex"

"IPT-Ex" is designed to detect ignitions, accompanied by temperature rise in closed hazardous areas

Specifications:

Explosion-proof labeling	**0ExiaIICT6 X**
Detector class (is specified by DIP-switch)	A1R, A2R, A3R, BR
Consumption current, not more than	100 µA
Alarm message	by consumption current step-up
IP rating	IP20
Operating temperature	minus 40…+75°C

Combined Smoke and Heat Detector "IPDT-Ex"

"IPDT-Ex" is designed to detect ignitions accompanied by smoke and / or temperature rise in closed hazardous areas.

Specifications:

Explosion-proof labeling	**0ExiaIICT6 X**
Sensitivity	0.05…0.2 dB/m
Detector class (is specified by DIP-switch)	A1R, A2R
Consumption current, not more than	100 µA
Alarm message	by consumption current step-up
IP rating	IP20
Operating temperature	minus 30…+55°C

Hand-held Fire Detector "IPR-Ex"

"IPR-EX" is designed for manual activation of "Fire" alarm signal in closed hazardous areas. Provides LED indication of "Norm" and "Fire" modes.

Specifications:

Explosion-proof labeling	**0ExiaIIBT6 X**
Consumption current, not more than	100 µA
Alarm message	by consumption current step-up
IP rating	IP54
Operating temperature	minus 30…+55°C

Switchgear “UK-Ex”

“UK-Ex” is designed to provide cross-plugging of intrinsically safe circuits in closed hazardous areas.
“UK-Ex” comprises six pairs of screwed terminal connections

Specifications:

Explosion-proof labeling	**0ExiaIICT6 X**
IP rating	IP65

Infrared Flame Detectors “IPP-Ex”

“IPP-Ex” and “IPP-Ex” version 1 are designed to detect ignitions accompanied by open flame in closed hazardous areas. Two versions are distinct in their detection zones types specified by different optical arrangement:

- “IPP-Ex”: detection range is 17 m, detection angle is 60°;
- “IPP-EX” version 1: detection range is 60 m, detection angle is 12°

Specifications:

Explosion-proof labeling	**0ExiaIIBT6 X**
Consumption current, not more than	15 mA
Alarm message	by relay (C “NO”) contacts closing
IP rating	IP65
Operating temperature	minus 40…+55°C

Linear Smoke Detector “IPDL-Ex”

“IPDL-Ex” is designed to detect ignitions accompanied by smoke in closed hazardous areas. “IPDL-Ex” comprises transmitting module (TM) and receiving module (RM)

Specifications:

Explosion-proof labeling	**0ExiaIIBT6 X**
Detection range	8…150 m
TM consumption current, not more than	10 mA
RM consumption current, not more than	20 mA
Alarm message	by relay (C «NO») contacts closing
IP rating	IP41
Operating temperature	minus 25…+55°C

Passive Infrared Detectors “Pyrone-1”

“Pyrone-1”, “Pyrone-1A”, “Pyrone-1B” are designed to detect intrusion into the protected hazardous areas.

- “Pyrone - 1”- wide angle detection zone, detection range 20 m;
- “Pyrone-1A”- long range detection zone, detection range 20 m;
- “Pyrone-1B”- vertical curtain detection zone, detection range 20m.

Two detection modes:

- “Open areas” – detection range is up to 12 m
- “Closed premises” - detection range is up to 20 m

The detectors are powered via alarm loop
Swivel bracket is supplied

Specifications:

Explosion-proof labeling of Pyrone 1, Pyrone-1B	**0ExiaIICT6 X**
Explosion-proof labeling of Pyrone 1A	**1ExibIICT6 X**
Consumption current, not more than	100 μA
Alarm message	by consumption current step-up or step-down
IP rating	IP65
Operating temperature	minus 40…+55°C

“Pyrone-1” – see diagram fig. 7
“Pyrone-1A” – see diagram fig. 9
“Pyrone-1B” – see diagram fig. 16

Passive Infrared Detectors “Foton-18”

“Foton-18”, “Foton-18A”, “Foton-18B” detectors are designed to detect intrusion into protected closed hazardous areas.

- “Foton-18” - wide angle detection zone, 12 m detection range
- “Foton-18A”- long range detection zone, 20 m detection range
- “Foton-18B”- vertical curtain detection zone, 15m detection range
- “Foton-18D”- wide angle detection zone, 10 m detection range and pet immunity up to 10 kg

Specifications:

Explosion-proof labeling	**0ExiaIIBT6X**
Consumption current, not more than	10 mA
Alarm message	by relay (C “NC”) contacts opening
IP rating	IP41
Operating temperature	minus 30…+50°C

«Foton-18» - see diagram fig. 2
«Foton-18A» - see diagram fig. 10
«Foton-18B» - see diagram fig. 15
«Foton-18D» - see diagram fig. 4

Passive infrared detector “Foton-SH-Ex”

“Foton-Sh-Ex” is designed to detect intrusion into the protected closed hazardous area through door and window openings

Specifications:

Explosion-proof labeling	**0ExiaIIBT6 X**
Maximum mounting height	5 m
Detection angle	70°
Consumption current, not more than	10 mA
Alarm message	by relay (C “NC”) contacts opening
IP rating	IP41
Operating temperature	minus 30…+50°C

“Foton-SH-Ex” – see diagram fig. 17

Flood Detector “STZ-Ex”

“STZ-Ex” is designed to detect water leaks in closed hazardous areas.
“STZ-Ex” comprises signal processor unit (SPU) and three sensor elements (SE).

Specifications:

Explosion-proof labeling	**0ExiaIIBT6 X**
Consumption current, not more than	10 mA
Alarm message	by relay (C “NC”) contacts opening
Dimensions: SPU SE	80×80×35 mm 65×21×16 mm
IP-rating: SPU SE	IP30 IP65
Operating temperature	minus 10 …+50°C

Seismic Vibration Detector “Shorokh-Ex”

“Shorokh-Ex” is designed to detect intentional destruction of the following structural elements: concrete and brick walls and floors, wooden structures, plywood, wood laminates, standard metal safes, cabinets and ATMs located in closed hazardous areas

Specifications:

Explosion-proof labeling	**0ExiaIIBT6 X**
Consumption current, not more than	25 mA
Alarm message	by relay (C “NC”) contacts opening
Protected area, maximum	12m^2
IP rating	IP30
Operating temperature	minus 30…+50°C

Glass Break Detector “Steklo-Ex”

“Steklo-Ex” is designed to detect destruction of the following kinds of plate glass: customary, quenched, patterned, armored, three-layer and laminated with polymer film, as well as glass blocks installed in closed hazardous areas.

Specifications:

Explosion-proof labeling	**0ExiaIIBT6 X**
Consumption current, not more than	20 mA
Alarm message	by relay (C “NC”) contacts opening
Maximum detection range, not less than	6 m
IP rating	IP30
Operating temperature	minus 20…+45°C

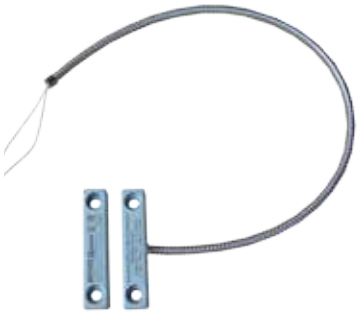
“Steklo-Ex» - see diagram fig. 19

“MK-EX” version 1

Magnetic Contacts “MK-Ex”

“MK-Ex” version 1 and version 2 are designed to provide control for opening or shifting of building structures moving elements (doors, windows, hatches, etc.) manufactured of magnetically conductive (steel) or magnetically non-conductive (aluminum, wooden, plastic) materials, located in closed hazardous areas.
Two versions are available:

- “MK-Ex” version 1 - plastic case
- “MK-Ex” version 2 - metal case



“MK-Ex” version 2

Specifications:

Explosion-proof labeling:	“MK-EX” vers.1 “MK-EX” vers.2	**0ExiaIIBT6 X** **0ExiaIICT6 X**
Operating temperature		minus 50…+50°C
IP rating:	“MK-EX” vers.1 “MK-EX” vers.2	IP44 IP65

Explosion-proof systems

"Yauza-Ex"

Explosion-proof control panels for hazardous areas protection

Panels are designed to arrange fire security alarm systems for hazardous areas protection
Application: security of objects of oil and gas complex, chemical, mining and metal working industries, filling stations, pharmaceutical, wood working, confectionery, grain processing companies, different warehouses and other objects containing hazardous areas

Features:

- Number of zones:
  - **"Yauza-4Ex"** - 4
  - **"Yauza-8Ex"** - 8
  - **"Yauza-16Ex"** - 16
- Detectors power supply from internal explosion-proof power supply units
- Possible connection of explosion-proof detectors with explosion-proof labeling or without explosion proofing with the help of explosion-proof barrier "BIZ-Ex"
- The panels may be supervised by means of:
  - Buttons on front panel, access to control is allowed after submission of key "Touch Memory"
  - Remote keypad with LED display "Yauza-KV" using access codes
  - Keys "Touch Memory" and readers installed in hazardous zones, using arming/disarming module "UPS- Ex", as well as outside hazardous areas
- Possible connection of backup power supply unit "Ladoga BP-A" for power supply of light and sound announciators and other peripheral devices, transfer of data and control of power supply unit is provided via communication bus of explosion-proof control panel "Yauza-Ex"
- Possible control of external light and sound announciators with control of communication lines:
  - In common industrial option installed outside hazardous area
  - In hazardous areas with equipment protection by flameproof enclosure «d»
  - In explosion hazardous zone with the most reliable explosion-proof security type
- Intrinsically safe loop "i" by means of built-in controlled intrinsically-safe power supply units
- Configuration by:
- DIP-switches (built-in operation tactics)
- Keypad "Yauza-KV"
- PC (configuration, updating of firmware version, monitoring of event log possibility)

Explosion-proof systems

Explosion-proof systems

Specifications:

	"Yauza-4Ex"	"Yauza-8Ex"	"Yauza-16Ex"
Explosion proof labeling	[Exia]IIC		
Number of loops	4	8	16
Types of loops	• fire • fire thermal • security • alarm • technological • user		
Number of explosion-proof supply units	2x100 mA	4x100 mA	8x100 mA
Number of controlled outputs	2		
Number of low-current relays	4		
Number of power relays	4		
Voltage of main supply unit	AC from 187 to 242 V, frequency 50 Hz		
Voltage of external backup supply unit V, DC	11…30 V		

Maximum number of devices connected to "Yausa-Ex":			
Arming/disarming modules "UPS-Ex" or "UPS-A"	16		
Keypads "Yauza-KV"	4		
Relay modules "Ladoga BRV-A" vers.2	4		
Mimic modules "Ladoga BVI-A"	4		
Output control modules "Ladoga BKV-A" or "BKV-Ex"	8		
Addressable backup power supply unit "Ladoga BP-A"	4		
Maximum capacity of battery installed in case	7 Ah	12 Ah	12 Ah
Operating temperature	-10…+50°C		
IP rating	IP20		
Dimensions (mm)	340×340×90	470×380×120	470×380×120
Weight without battery	4.5 kg	7.0 kg	7.5 kg

Explosion-proof systems

"Yauza-PU-Ex"

Control and Extinguishing Fire Alarm panel

Features:

Designed for autonomous or joint operation as a part of fire security systems at objects of different application inside hazardous areas. Refers to electrical equipment, should be installed outside hazardous areas. Explosion-proof labeling [Exib]IIB
One direction of fire extinguishing
Types of connected fire extinguishing modules: powder fire fighting, gaseous fire supression, water mist fire fighting

Provides:
- receipt signals from automatic and hand-held fire detectors, as well as remote start panel (PDP)
- power supply of detectors by means of 4-wire connection scheme
- connection of detectors with flame-proof enclosure "d" with the use of explosion-proof barriers BIZ-Ex
- acceptance of acknowledgement of hand-held fire detectors to loop
- connecting up to 5 PDP into the loop of remote start with acceptance acknowledgement
- connecting up to 5 detectors with normally closed contacts into door control loop of controlled premise
- supervision of explosion-proof and non-explosion-proof light and sound announciators with control of communication bus
- supervision of gas and smoke exhaust systems and other engineering systems and relays
- PC configuration via USB
- automatic, remote or manual activation of fire extinguishing
- possible application if the area neighboring to controlled premise is hazardous

Supervision of the panel is provided by buttons on the front panel of the device or by keypads "Yauza-KV"
- Sabotage protection

Restoration of mode "Automatic activation" of fire extinguishing is provided at front panel of the unit or by means of remote keypad "Yauza-KV", and in hazardous area with the help of UPS-Ex module
Event log is maintained (4000 events), which can be viewed from PC via USB, or by means of keypad "Yauza-KV"
Provides operation with detectors and announcers produced by "RIELTA" JSC and other manufacturers

Specifications:

Intrinsically safe loops of fire alarm system	4	[Exia]IIC
Intrinsically safe outputs for power supply of detectors 12V 100 mA	2	[Exia]IIC
*PDP connection loop * remote start panel	1	
Intrinsically safe loop of PDP remote start	1	[Exia]IIC
Intrinsically safe door control loop	1	[Exia]IIC
Fire extinguishing agent (FEA) sufficiency control loop	1	
Intrinsically safe loop of FEA sufficiency control	1	[Exia]IIC
FEA supply control loop	1	
Intrinsically safe loop of FEA supply control	1	[Exia]IIC
Intrinsically safe output of FEA start-up 12 V 600 mA	4	[Exib]IIB
Annunciator's outputs 12 V 500 mA	5	
Intrinsically safe announcer's outputs 12V 150 mA	4	[Exia]IIC
Extension of announcer's outputs with external modules BKV-A	32	
Extension of intrinsically safe outputs of FEA and outputs of announcers by means of external modules BKV-Ex 12V 150 mA		[Exia]IIC
Alarm relays	4	
Power supply programmable relay	4	
Extension of programmable power supply relay with external relay modules BRV-A	32	

Power supply:	• AC power supply • DC external power supply unit • Built-in batteries	~220V 50Hz = 10…30 V 12V 24Ah
Operating temperature		-25…+55°C
Dimensions		400x530x110 mm

Keypad "Yauza-KV"

Designed to display information about current status of the control panel, its configuration, supervision and event log monitoring
Installed outside of **hazardous area**

Specifications:

Maximum number of units switched to "Yauza-Ex"	4
Current consumption, max	100 mA
Operating temperature	-10…+50°C
IP rating	IP30
Dimensions	165x115x45 mm

Arming/disarming module "UPS-Ex"

Designed for arming and disarming of "Yauza-Ex" unit
Comprises:
- "UPS-Ex", installed outside hazardous zone
- Reader TM "STM-Ex"
- Electronic key "TM-Ex"

"TM-Ex" and "STM-Ex" are the parts of "UPS-Ex", refer to common electrical equipment and may be used in hazardous zone

Specifications:

Explosion proof labeling	[Exia] IIC
Maximum number of units switched to "Yauza-Ex"	16
Current consumption, max	20 mA
Operating temperature	-40…+55°C
IP rating	IP40
Dimensions • UPS-Ex • STM-Ex • TM-Ex	 165x115x45 mm 62x40x32 mm 50x25x15 mm

Explosion-proof barrier "BIZ-Ex"

Provides switching detectors without explosion-proof labeling to the "Yauza-Ex" loop
Produced in two versions "BIZ-Ex" and "BIZ-Ex" vers. 1
"BIZ-Ex" vers.1 includes built-in intrinsically safe supply unit 12V 100 mA

Specifications:

Explosion proof labeling	[Exia] IS
Current consumption, max (BIZ-Ex vers.1)	150 mA
Operating temperature	-40…+55°C
IP rating	IP40
Dimensions	165x115x45 mm

"Ladoga RK"

Wireless Security & Fire Alarm Products Line

Features:

- Advanced modern receiver-transmitter
- Two-way radio exchange
- Operating frequency range - 433.05 … 434.79 MHz
- Range of coverage in open space up to 1000 meters
- 8 operating frequency numbers, each comprising main frequency and reserve one
- Automatic change-over to reserve frequency
- 126 digital networks for each operating frequency
- Up to 254 detectors in the same network
- Data dynamic encryption
- Protection against detectors substitution
- Variable period of radio communication sessions
- Adaptive power of the transmitter
- Main and backup power supply batteries
- Battery life up to 10 years
- Control and forecast ability of batteries discharge
- Extended information capacity
- Retransmission support
- Developed wireless product line
- Integration with any control panel

Wireless Passive Infrared Detector «Pyrone-4-RK»

Designed to provide detection of intrusion into a protected area of a closed premise. Provides wide angle detection zone and PET immunity **up to 20 kg**

up to 20 kg

Specifications:

Maximum detection range	10 m
Operating temperature	-20…+50°C
IP rating	IP41
Dimensions	90×60×50 mm
Power supply battery	CR123A
Battery life, at least	8 years

"Piron-4-RK" – see diagram fig. 4

Wireless Passive Infrared Detectors “Foton-12-RK”, “Foton-12B-RK”

Designed to provide detection of intrusion into a protected area of a closed premise .
• «Foton-12-RK» - wide angle
• «Foton-12B-RK» - vertical curtain
Power supply is provided by main and backup power supply batteries.

Specifications:

Maximum detection range • Foton-12-RK • Foton-12B-RK	 12 m 15 m
Operating temperature	-20…+50°C
IP rating	IP41
Dimensions	92×57×48 mm
Power supply batteries	CR123A, CR2450
Battery life, at least	8 years

“Foton-12-RK” – see diagram fig. 5
“Foton-12B-RK” – see diagram fig. 14

Wireless Passive Infrared Detectors “Foton-19-RK”, “Pyrone-5-PK”

Designed to provide detection of intrusion into a protected area of a closed premise.
Wide angle detection zone.
The detectors provide PET immunity **up to 40 kg**.
Adjustable detectability:
- PET immunity up to 10 kg (cats, lap-dogs)
- PET immunity up to 20 kg (short-hair dogs with the temperature contrast 8°C), up to 40 kg (or long-hair dogs with the temperature contrast 6°C).
“Foton-19-RK” power supply is provided by main and backup power supply batteries.
“Pyrone-5-RK” power supply is provided by one power supply battery.

up to 40 kg

Specifications:

Maximum detection range	10 m
Operating temperature	minus 20…+50°C
IP rating	IP41
Dimensions	105×75×56 mm
Power supply batteries: “Foton-19-RK” “Pyrone-5-RK”	 CR123A, CR2450 CR123A
Battery life, at least	8 years

“Foton-19PK” – see diagram fig. 4

Wireless Passive Infrared Detectors “Foton-SH2-RK” “Pyrone-SH2-RK”

Designed to detect intrusion into a protected area of closed premise through window and door frames.
Vertical curtain detection zone.

The detector base has four flat surfaces for mounting in the usual way above the secured opening, as well as directly in the opening (in a window or a door frame corners) without a swivel bracket.
Pyrone-SH2-RK provides control of radial alarm loop state (AL).
The detector power supply is provided by one power supply battery

Specifications:

Maximum mounting height	5 m
Detection angle	90°
Operating temperature	-20…+50°C
IP rating	IP41
Dimensions	80x47x40 mm
Power supply battery	CR123A
Battery life, at least	8 years

“Foton-SH2-RK” – see diagram fig. 18

Wireless Passive Infrared Detectors for Open Areas “Pyrone-8-RK”, “Pyrone-8B-RK”

Designed to detect intrusion into an **outdoor secured area**.
• Pyrone-8-RK – wide angle detection zone;
• Pyrone-8B-RK – vertical curtain detection zone.
Two-channel processing algorithm decreases false-alarm probability.
Provide pet immunity up to 20 kg

Specifications:

Maximum detection range	12 m
Operating temperature	-40…+50°C
IP rating	IP54
Weight, max	0.2 kg
Dimensions , max	180×70×60 mm
Power supply batteries, two elements	CR123A
Battery life, at least	5 years

“Pyrone-8” – see diagram fig. 7
“Pyrone-8B” – see diagram fig. 16

Wireless Magnetic Contacts “Ladoga MK-RK”, “Ladoga MK-RK”Vers.1, “Ladoga MK-RK”Vers.3

Designed to provide monitoring of doors, windows, cabinets and other structural components of closed premise for opening (shift).
Detector versions:
• “Ladoga MK-RK”, “Ladoga MK-RK”Vers.3 are single-zone detectors, providing control of one loop or built-in hermetic contact
• “Ladoga MK-RK” Vers.1 is two-zone detector, providing control of two loops or one loop and built-in hermetic contact. Built-in sound alarm.

Power supply of “Ladoga MK-RK”, “Ladoga MK-RK”Vers.1 is provided by main and backup power supply batteries. Power supply of “Ladoga MK-RK”Vers.3 is suppeied by one battery

Specifications:

Operating temperature	-20…+50°C
IP rating	IP30
Dimensions	112x41x32 mm
Power supply batteries: • “Ladoga MK-RK”, “Ladoga MK-RK”Vers.1 • “Ladoga MK-RK”Vers.3	 CR123A, CR2450 CR123A
Battery life, at least	10 years

Wireless Magnetic Contact “Ladoga MK-RK”Vers.2

Designed to provide monitoring of doors, windows, cabinets and other structural components of closed premise for opening (shift).
Miniature case protected from moisture and dust.
The detector is powered by main and backup power supply batteries.

Specifications:

Operating temperature	-20…+50°C
IP rating	IP54
Dimensions	65x55x20 mm
Power supply batteries, two elements	CR2450
Battery life, at least	6 years

Wireless Magnetic Contact “Ladoga MK-RK”Vers.4

Designed to provide monitoring of doors, windows, cabinets and other structural components of closed premises for opening (shift).
Miniature case.
Neodymium magnet.

Specifications:

Distance between detector and magnet	disconnection – more than 15mm, restoration – less than 5 mm
Operating temperature	-20…+50°C
IP rating	IP40
Dimensions	96x24x21 mm
Power supply battery	CR123A
Battery life, at least	10 years

Wireless Glass Break Detector “Steklo-3RK”, “Zvon-RK”

Designed to detect destruction of the following types of construction glasses: common, quenched, patterned, armored, multilayer and protected with polymer tape (laminated), as well as glass hollow blocks, and standard double- and triple-chamber windows.
Zvon-RK provides control of radial alarm loop state (AL)
Power supply is provided by main and backup power supply batteries.

Specifications:

Maximum detection range	6 m
Minimal controlled glass area	0,1 m^2
Operating temperature	-20…+45°C
IP rating	IP 30
Dimensions	105x50x40 mm
Power supply batteries	CR123A, CR2450
Battery life, at least	5 years

Security Wireless Inertia Detector “Gran-RK”

Designed to provide detection of:
- item displacement for the distance 0.25m or more with the acceleration of 0.5 m/s^2;
- item tilt changing 3° or more

The detector is powered by main and backup power supply batteries.

Specifications:

Operating temperature	-10…+50°C
IP rating	IP54
Dimensions	65x55x20 mm
Power supply batteries, two elements	CR2450
Battery life, not less	1 year

Alarm Button “Ladoga KTS-RK”, “Ladoga KTS-RK” Vers.1

Designed for manual generation and transmission of “Alarm” messages with additional supervision codes (arming, disarming).
Ladoga-KTS-RK Vers.1 confirms supervision command delivery to the control panel by case vibration.
“Ladoga KTS-RK ”may be applied as an ”Arming/ disarming” key holder.

Specifications:

Operating temperature	-20…+50°C
IP rating	IP54
Dimensions	38x67x18 mm
Power supply battery	CR2450
Battery life, at least	10 year

Wireless Remote Operating Console "PUV-RK"

Designed for operation as a component of a security system or of any types of supervision and control systems.
Provides minimal task-list execution: user identification code entry, execution of commands, indication of readiness signals and controlled areas status.

Specifications:

Operating temperature	-20…+50°C
IP rating	IP30
Dimensions	105×71×28 mm
Power supply battery	CR123A
Battery life, not less	3 years

Wireless Smoke Detector "Ladoga PD-RK"

Designed for detection of ignition, accompanied by smoke.
Ensures control of the dust level in the smoke chamber, as well as sensitivity decrease.
Sensitivity range 0.05…. 0.2 dB/m
Power supply is provided by main and backup power supply batteries.

Specifications:

Operating temperature	-20…+55°C
IP rating	IP30
Dimensions	Ø121x54 mm
Power supply batteries, two elements	CR123A
Battery life, at least	10 years

Wireless Independent Smoke Detector "Ladoga PD-RK-A"

Designed to detect ignitions, accompanied by smoke, as well as for "Fire" alarm sound warning.
Ensures control of the dust level in the smoke chamber, as well as sensitivity decrease.
Provides level monitoring the dust in a smoke chamber and control of sensitivity loss.
Stand-alone mode of operation.
High information content.
Built-in siren.

Specifications:

Operating temperature	-20…+55°C
IP rating	IP30
Sound-pressure level at a distance of 1 m from the detector, at least	85 dB
Dimensions	Ø121x54 mm
Power supply batteries, two elements	CR123A
Battery life, not less	5 years

Wireless Hand-held Fire Detector “Ladoga IPR-RK”

Designed for hand-held switching, generation and sending of fire alarm messages.
Power supply is provided by main and backup power supply batteries.

Specifications:

Operating temperature	-20…+55°C
IP rating	IP54
Dimensions	105x95x50 mm
Power supply batteries	CR123A, CR2450
Battery life, not less	5 years

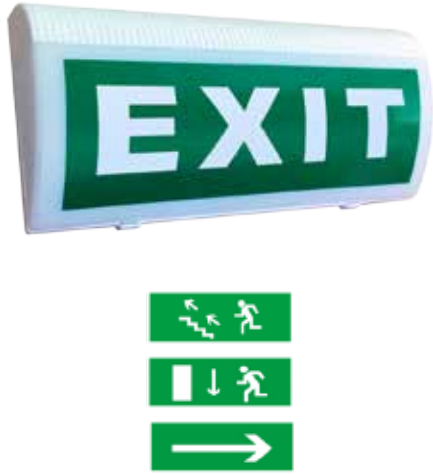
Sound Alarm Annunciator “Trubach-RK”

Designed to inform people about fire break-out or other extreme events by announcement sound.
Armed with an additional alarm LED indication.
Alarm modes and status control are set by user during system adjustment.
Power supply is provided by main and backup power supply batteries.

Specifications:

Generated audio signals frequency	2000…4000 Hz
Sound-pressure level at one meter distance from the annunciator, at least	85 dB
Operating temperature	-20…+55°C
IP rating	IP20
Power supply batteries, two elements	CR123A
Dimensions	Ø121x54 mm
Battery life, not less	3 years

Light Alarm Annunciator “Trubach-T-RK”



Designed to provide evacuation management in case of fire break-out or other extreme event. Parameters and modes of light signal are assigned during system adjustment. Power supply is provided by main and backup power supply batteries.

Specifications:

Power supply: - external power supply V DC - standalone power supply, two elements	 10…15 V CR123A
Current consumption under external power supply: - in standby mode, max - in active mode, max	 5 mA 80 mA
Operation duration in standalone mode: - in standby mode, not less - in active mode, not less	 5 years 10 hours
Operating temperature	-20…+55°C
IP rating	IP20
Dimensions	330x150x62 mm

Combined Sound & Light Alarm Annunciator "Trubach-1-RK"

Designed to inform people about fire break-out and other emergencies by sound and light warning

Specifications:

Operating temperature	-20…+55°C
IP rating	IP30
Dimensions	121x75x43 mm
Power supply battery	CR123A
Battery life, at least	5 years
Sound-pressure level at a distance of 1 m from the detector, at least	85 dB

Wireless Flood Detector "STZ-RK"

Designed to detect leaks of water, antifreeze substances and any other non-aggressive current-conductive liquids. Consists of Signal Processing Module (SPM) and external flood sensors FS (two FS DZ-3V are supplied).
Possibility of connection up to 4 FS.
SPM power supply is provided by main and backup power supply batteries.

Specifications:

Operating temperature		-20…+50°C
IP rating	• SPM • FS	IP 30 IP 67
Dimensions	• SPM • FS	112x41x32 mm 65x22x16 mm
Power supply batteries, two elements		CR123A, CR2450
Battery life, at least		10 years

Flood Sensor "DZ-3V"

Flood sensor «DZ-3V» is intended for detecting water leaks from water pipelines used for water supply and heating of private residences, high-rise apartment houses, boilerhouses, etc.
It is possible to install the sensor both on the floor and on the wall.

Specifications:

Minimum thickness of a layer of liquid for generating a «Flood» message	1 mm and more
Interference protection	Touching with a damp object (a rag, etc.)
Operating temperature	-20…+50°C
IP rating	IP 67
Dimensions	65x22x16 mm
Weight	0,05 kg
Cable length	1,5 m

Wireless Flood Detector "STZ-RK" Vers.1

Designed to detect leaks of water from water-supply pipelines or heating facilities
Small-outline package protected from dust and moisture without external units.
"STZ-RK" Vers.1 power supply is provided by main and backup power supply batteries.

Specifications:

Operating temperature	-20…+50°C
IP rating	IP65
Dimensions	65x55x20 mm
Power supply batteries, two elements	CR2450
Battery life, at least	7 years

Wireless Temperature Detector “Celcius-RK”

Designed to provide monitoring of temperature conditions and sending message, if the temperature value exceeds limits of a set range.
Consists of signal processing unit (SPU) and two external temperature sensors (TS).
Two temperature measurement and control channels:
Channel 1 – built-in temperature sensor
Channel 2 – external temperature sensor (supplied optionally)
Possibility of operation both in one-channel and two-channel operation modes.
Operation in standalone mode is also possible.
The detector is powered by main and back-up power supply batteries.

Specifications:

Operating temperature SPU	-20…+50°C
IP rating	IP 30
Dimensions	112x41x32 mm
Power supply batteries	CR123A, CR2032
Battery life, not less	2 years

External Temperature Sensor

Designed for temperature control.
External temperature sensor is connected to the detector “Celsius-RK” or other devices receiving messages in "1-wire" protocol.

Specifications:

Operating temperature	-55…+125°C
IP rating	IP65

Wireless Zone Extension Modules “Ladoga BRSS-RK”

Designed to provide the monitoring of security and fire detectors state via two-way communication and transmission of received information via additional wire interface by the “RIELTA-Contact-R” protocol.

BRSS-RK-485 Vers.1, Vers.2, Vers.3

- Designed to provide information transmission via communication bus to any control panel, supporting “RIELTA RK-485” protocol.

Specifications:

Operating temperature	-30…+50°C
Power supply V DC	10…15 V
Current consumption, max	50 mA
IP rating	IP20
Dimensions BRSS-RK-485 Vers.1, Vers.2 Vers.3	 82x57x32 mm 165x115x43 mm

Repeater “Ladoga-BRSS-RK-RTR”

Designed to provide connection of detectors located in poor-reception areas

Specifications:

Operating temperature	-30…+50°C
Power supply	10…15 V DC
Current consumption, max	50 mA
IP rating	IP20
Dimensions	82x57x32 mm

Repeater “Ladoga-BRSS-RK-RTR” Vers.1

Designed to provide connection of detectors located in poor-reception areas.
Differs from “BRSS-RK-RTR” in comprisal of built-in power supply unit.

Specifications:

Operating temperature	-20…+50°C
Power supply	10…15 V DC
Current consumption with account of battery charge, max	170 mA
IP rating	IP20
Dimensions	165x115x43 mm
Backup battery capacity, at least	1.2 Ahr, 6V
Backup battery operation time from fully-charged 1.2Ahr battery, at least	7 days

Repeater “Ladoga-BRSS-RK-RTR” Vers.2

Designed to provide connection of detectors located in poor-reception areas.
Built-in power supply battery LIR 14500 type.
Battery operation time is not less than 20 hours.
AC power supply.

Specifications:

Operating temperature	-20…+50°C
AC power supply	170 - 252 V AC
IP rating	IP20
Dimensions	65x65x34 mm

Autonomous Wireless System on the Basis of Alarm-Circuit Extension Modules with Relay Output "Ladoga BRSS-RK-R"

Designed to provide status control and supervision of wireless security, fire detectors and other terminal unit's operation modes, as well as transmission of received information to output relay contacts. Applied for integration of a wireless system into existing equipment of a secured facility (provides connection to any control panel).

Features of "Ladoga BRSS-RK-R":

- Includes up to 28 wireless detectors, up to 28 KTS-RK in any combination
- 6 relays available:
  - 4 relays are used to transmit "Alarm" message about intrusion into protected zones and detectors disconnection
  - 1 relay is used to transmit a failure message,
  - 1 relay is used to transmit case tamper information
- Provides the detectors compatibility to the relay outputs
- User interface with high informative capacity ensures detection of failures in the system without any additional devices

Specifications:

Operating temperature	-30…+50°C
Power supply V DC	10…15 V
Current consumption, max	70 mA
Relay parameters	72 V, 0,1 A
IP rating	IP20
Dimensions	165x115x43 mm

Wireless Executive Relay «IR-RK»

IR-RK is designed for load application to AC mains by the command via radio communication channel.

Specifications:

Power supply V AC	187-242 V AC
Maximum commutated current Output voltage	7 A equal to Usupply
Operating temperature	-30…+50°C
IP rating	IP20
Dimensions	65x65x34 mm

Wireless Executive Open-frame Relay «IR-RK» Vers. 1

Designed to supervise executive modules (light and sound indicators) by means of relay output.

Specifications:

Power supply V AC	187-242 V
Number of relay outputs - maximum commutated current - maximum commutated voltage	1 3 A 30B(DC)/250B(AC)
Operating temperature	-30…+50°C
IP rating	IP20

Outputs Control Module “BKV-RK”

Designed to supervise executive modules (light and sound annunciators) with rated voltage 12 V and current consumption 100 mA, to provide their power supply and control.
BKV-RK power supply is provided by an external power supply or by a standalone supply.

Specifications:

Power supply: - external power supply V DC - standalone power supply	 10,2…16 V CR123A 6 elements
Current consumption under external power supply: - in standby mode, max - in active mode, max (maximum total load on outputs 200 mA)	 15 mA 290 mA
Battery life under standalone power supply: - in standby mode, not less than - in active mode, not less than (maximum outputs total load current 200 mA)	 3 years 4 hours
Number of controlled relays Maximum current commutated by each controlled output	2 100 mA
Output voltage: - external power supply - standalone power supply	 9,5…15,5 V 9,5…13,2 V
Operating temperature	-20…+50°C
IP rating	IP20
Dimensions, max	165x115x43 mm
Weight (without batteries), max	0,2 kg

Wireless Relay Module “BRV-RK”

Designed for external devices control by means of relay outputs. BRV-RK is powered by the external power supply.

Specifications:

Power supply	9,8…16 V DC
Current consumption : - in standby mode, max - in active mode, max	 15 mA 130 mA
Number of controlled relays - maximum commutated current - maximum commutated voltage	2 7 A 30 V
Operating temperature	-30…+50°C
IP rating	IP20
Dimensions	165x115x43 mm
Weight, max	0,3 kg

Wireless Interface Module “Ladoga-RKI”

Designed for terminal devices operation modes control and management via two-way communication in the 433.05 … 434.79 MHz frequency range by the “Rielta-Contact-R” protocol, as well as transmission of the received data via serial interface “UART” to a control panel, supporting “Rielta-RK-485” protocol.
RKI provides support of up to 31 wireless terminal devices.

Specifications:

Power supply V DC	3…5 V
Consumption current, maximum	50 mA
Operating temperature	-30…+50°C
Dimensions, maximum	70x15x20 mm

*Under normal climatic conditions, minimum transmitter power and radio communication period not less than 1 minute

Light and Automation Management System

A set of inexpensive professional lighting control equipment is designed for automatic control (activation and deactivation) of light groups or other devices within closed or open areas in response to a signal generated by infrared motion sensor.

Specially designed sensors and control modules are highly effective for exploitation in premises of different application: residential buildings, parking lots, warehouses, production and office buildings, as well as in perimeter zone. The system is able to activate and deactivate any load automatically in case of human movement/ presence within sensors detection zone or by the command from the push-button control set.

Infrared motion sensors with high aperture Fresnel lens reliably detect people appearing in the sensor detection zone with the detection range up to 20 meters. In response to a signal from sensor the control unit switches ON lamps or lighting groups for a specified time.

Lighting and home automation management systems are presented both in the wired version (control signal and power supply of the sensor transmitting via the wire from the control module) and in wireless version (control signal transmitting via the radio channel).

Infrared motion (presence) sensors are designed to detect movement in the controlled area and to transmit the control signal to the control module. All sensors comprise built-in natural illumination sensor, providing devices operation blocking during the daytime.
Detection range – up to 14 m.
IP rating – IP 40, IP 54
Operational temperature – minus 30… +50°C
OFF-delay – 5; 20; 40; 80; 160 sec.
Voltage supply – 10 … 24 V

Control modules are designed for activation and deactivation of loads (lamps, household appliances, pumps, motors and other automation devices) by signals from sensors. All wired control modules have compact-sized cases made of impact-resistant plastic, all of them comprise built-in power supplies. Control modules differ in switching power values.
Power supply – 187 … 242 V / 50 Hz
Switching voltage – 220 V.
Switching current – 4,5 A, 10 A
Built-in power supply – 24V

Radio-channel executive relays are designed for connection the load to the 230V (executive relay IR-RK) network and for devices control via the relay output (executive relay IR-RK test 1). External devices operation (switching ON and OFF) is controlled by a signal from a wireless motion sensor, temperature sensor, tilt sensor, as well as flood or gas sensors. The devices operate as components of "Ladoga-RK" wireless system in 433 MHz frequency range.
Voltage supply – 187 - 242 V.
Relay outputs – 1
Operating temperature – minus 30…+50°C
IP rating – IP 20

The push-button control set is designed for manual generation and transmission of control signals to the executive relays: IR-RK and IR-RK test 1 via radio communication.
Operating frequency range – 433.05 … 434.79 MHz
Operating temperature – minus 20…+50°C
Power supply battery type – CR2450

Optical Filters

Optical filters based on interference multilayer coatings are designed with application of a specially developed CAD system. Layers are created in high-performance vacuum equipment with automatic process control by resistance and electron-beam evaporation. We are able to produce solar blend cut-off and longpass filters in the middle infrared spectrum range.
The main assignment of the optical filters produced by "RIELTA" company:
- cut-off interference filters for own product line of PIR detectors providing high white light immunity level (WLI);
- longpass filters for flame detectors.

Main characteristics of the serial production:

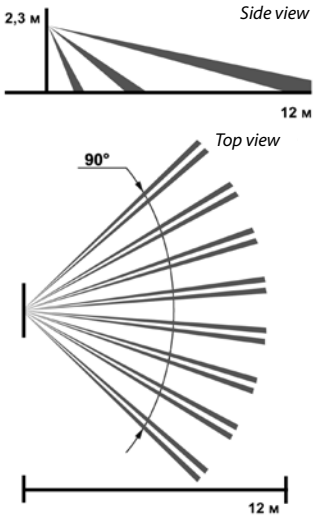
1. Solar blend longpass filters
   - substrate - silicon plates 0.3-0.5 mm thick with sizes - 7x7, 10x10, and 17x17 mm;
   - operation range – up to 16 μm;
   - cut-off wavelength - 5.5 microns; 6.5 microns; 7 μm; 7.5 μm;
   - suppression of infrared radiation - not worse than 99.95%;
   - transmission of infrared radiation - 85-90%;
   - mechanical strength and resistance to climatic factors - according to Russian Standard 3-1901-95;
   - WLI>6500 lux
2. Band-pass filters for hot CO2 emission line
   - substrate - silicon plates 0.3-0.5 mm thick with sizes - 7x7, 10x10 and 17x17 μm;
   - operation range – up to 8μm;
   - cut-off wavelength - 4 μm; 4.4 μm; 5 μm;
   - suppression of infrared radiation - not worse than 75 - 85%;
   - transmission of infrared radiation - 85-90%;
   - transmission bandwidth – 160 – 190 nm
   - mechanical strength and resistance to climatic factors - according to Russian Standard 3-1901-95;

Dielectric optical coatings production possibilities:

- cutting filters,
- interference and band-pass filters,
- antireflection coatings for optical parts made of various materials,
- mirrors and beam splitters,
- other optical coatings upon customer request

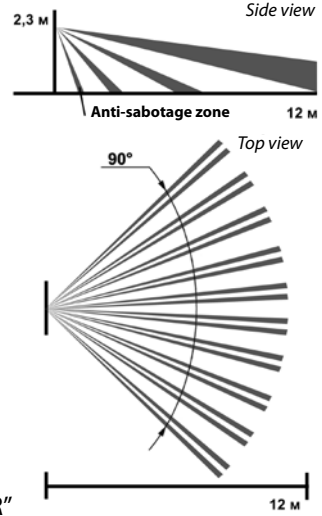
Wide angle

1



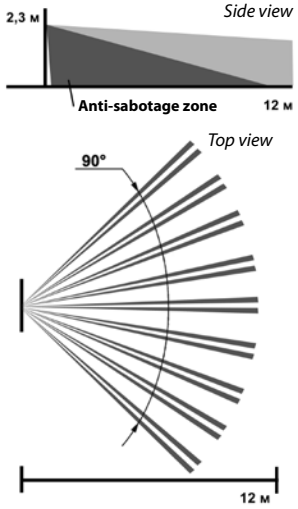
"Foton-6"

2



"Foton-10"
"Foton-12-1"
"Foton-15"
"Foton-16"
"Pirs-1-1/2/2V"
"Foton-17"
"Foton-18"
"Foton-12-ADR"
"Ladoga IKSHS-A"

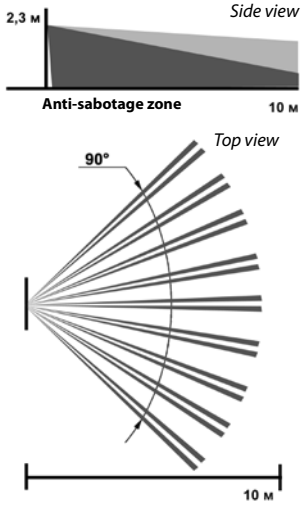
3



"Pyrone-4"
"Pyrone-4" vers.1
"Pyrone-4" vers.2 (18 m)
"Pyrone-7"

"Orlan"
"Foton-10M"
"Foton-10M-01"
"Foton-10MD"

4

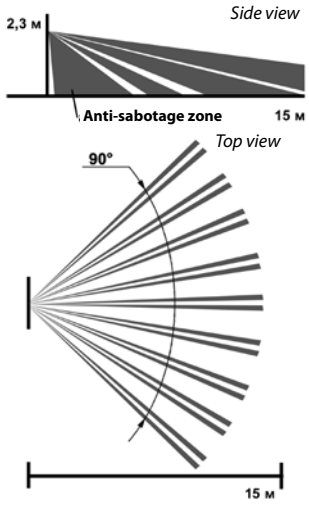


"Foton-19"
"Pyrone-5"
"Foton-18D"
"Pyrone-4D"
"Pyrone-7D"

"Orlan-D"
"Pyrone-4-RK"
"Foton-19RK"
"Foton-19-ADR"

Wide angle

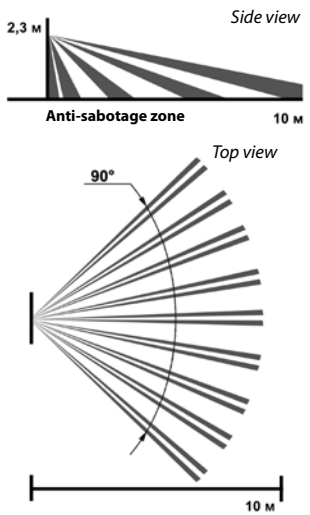
5



"Foton-20"
"Foton-12" (12 m)

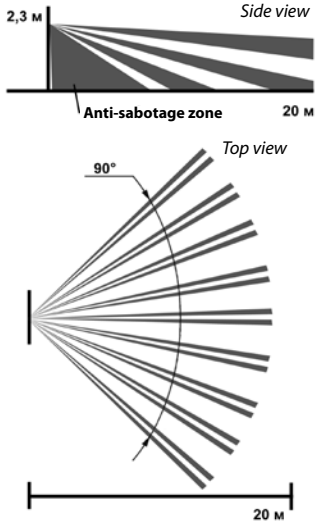
"Foton-12-RK" (12 m)
"Foton-12-1" (12 m)

6



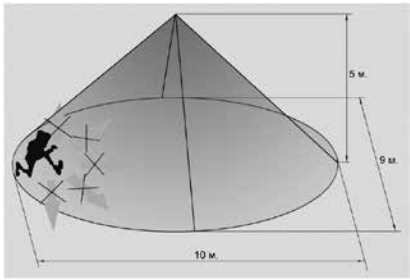
"Foton-9"
"Foton-9M"

7



"Foton-22"
"Pyrone-1"
"Pyrone-8" (12 m)

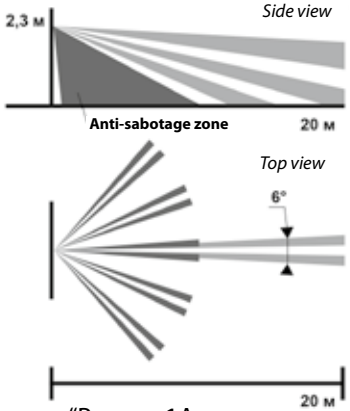
8



"Foton-21"
"Pyrone-6"
"Orlan-2"

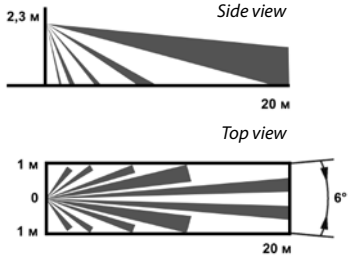
Long range

9



"Pyrone-1A

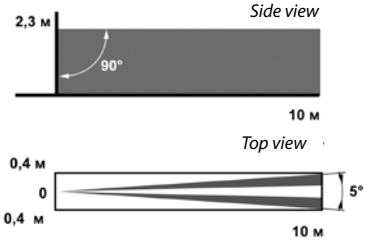
10



"Foton-10A"
"Foton-15A"
"Foton-16A"
"Pirs-1-3"
"Foton-18A"

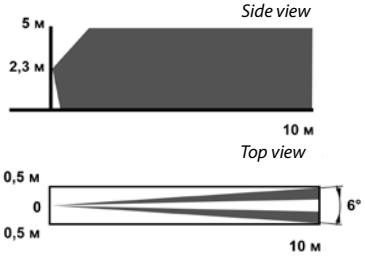
Vertical curtain

11



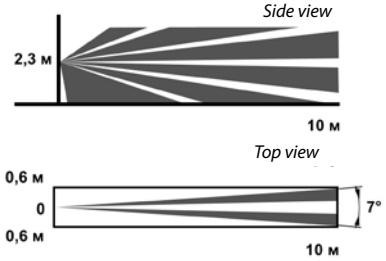
"Pyrone-3B"

12



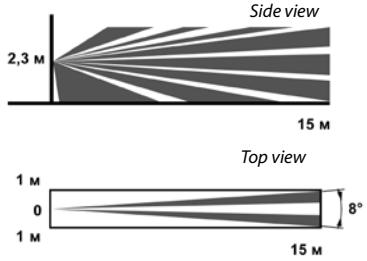
"Foton-10B"
"Foton-15B"
"Orlan-SH"

13



"Foton-10BM"
"Pyrone-4B"

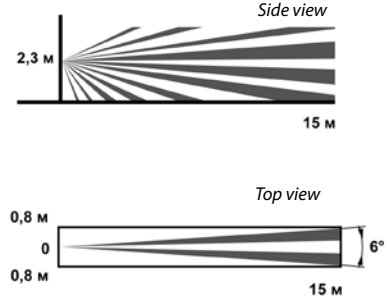
14



"Foton-12B" "Foton-12B-RK"
"Foton-12-1B" "Foton-20B"

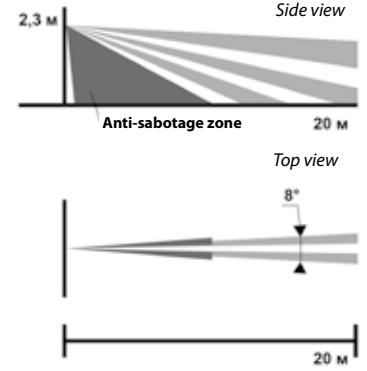
Vertical curtain

15



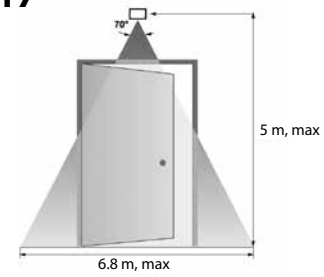
"Foton-16B"
"Foton-18B"
"Foton-12B-ADR"

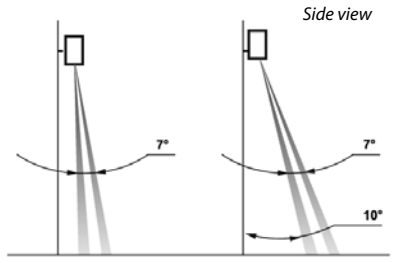
16



"Foton-22B"
"Pyrone-8B" (12 m)
"Pyrone-1B"

17

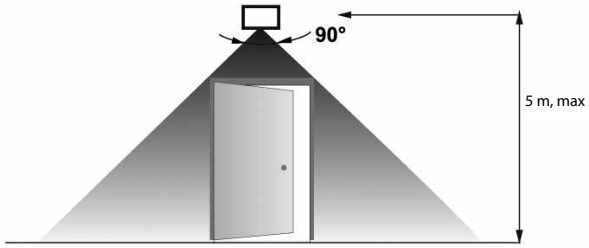


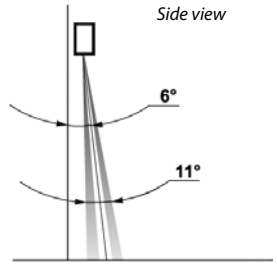


"Foton- SH"
"Foton- SH-1"

"Foton-SH-Ex"
"Foton- SH-ADR"

18

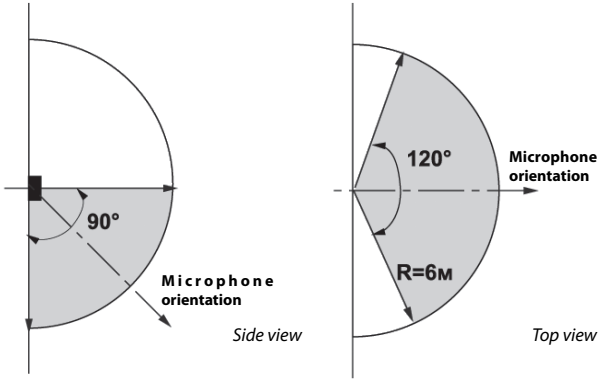




"Foton-SH2" "Pyrone-SH vers.3"
"Pyrone-SH" "Foton-SH2-RK"
"Passenger traffic detector SH2"

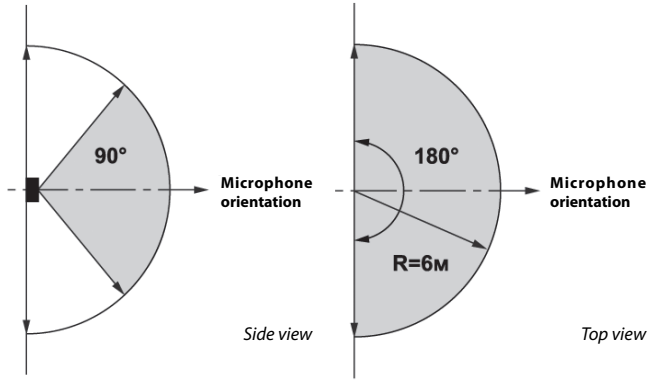
Detection zone of surface sound detectors

19

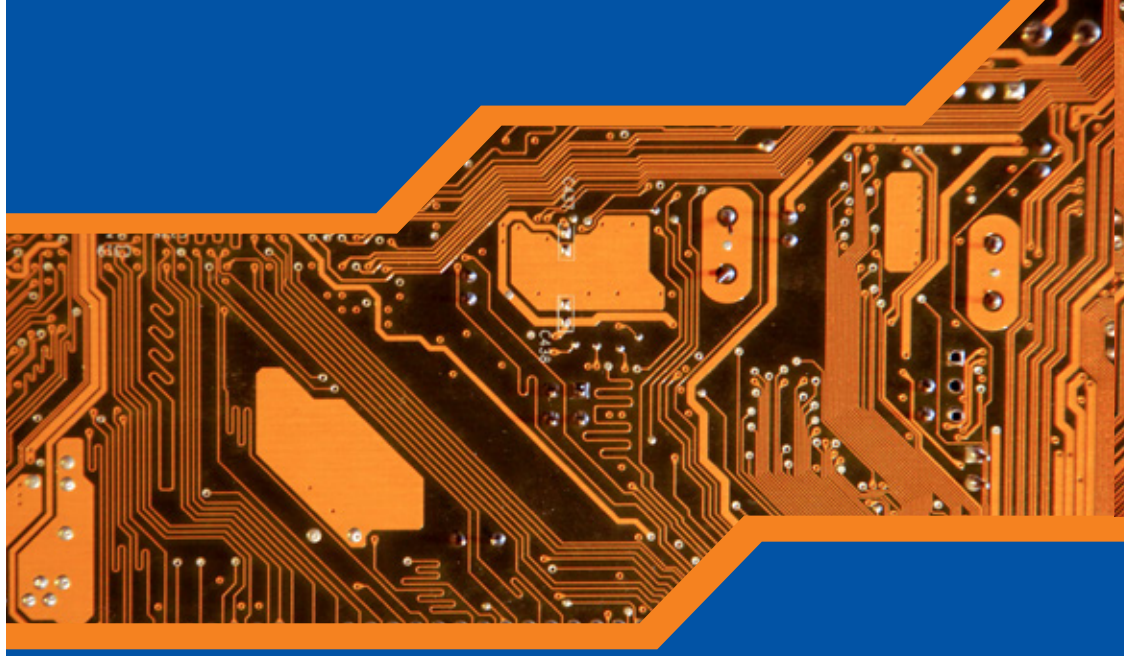


"Steklo-2"
"Steklo-3"
"Steklo-3M"
"Steklo-4"
"Zvon-1"
"Zvon-1vers.1"
"Zvon-RK"
"Steklo-Ex"
"Steklo-3RK"
"Steklo-3A"
"Orlan-2"

20



"Orlan"
"Orlan-SH"
"Orlan-D"
"Pyrone-7"
"Pyrone-7D"



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