Cabinet SZOR

The cabinet may be installed and operated at level crossings with railway lines and sidings. The cabinet is a component of level crossing system type UP-1 which is used to ensure safety at crossings of public roads and railway lines by blocking the traffic with boom barriers. It enables local and remote control of boom barriers.

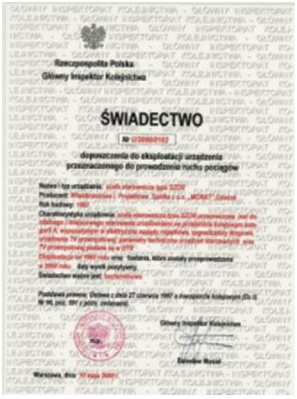
Level-crossing system UP-1 comprises control and monitoring equipment, i.e. SZOR controls cabinet with power supply module and manipulator, and warning equipment, including actuators and signals, such as gate machines, boom barriers with lights, road signals, acoustic generators (a typhon or a slow bell).

The system may comprise additional equipment, mostly CCTV system used in remote monitoring of the level crossing.

The system also enables mating with interlocking rail traffic control equipment, coordinating railway operations with the status of crossing equipment. The system also works with other signal systems, e.g. street signals, break-in signals, etc.

CERTIFICATE

SZOR cabinet has Certificate of Admission to use in PKP network no. U/2000/0102.


ŚWIADECTWO

Controls cabinet type SZOR is a two-sided steel cabinet made of galvanized sheets, protected with corrosion proof coat and surface coat in blue or grey colour – other colours as per the order. The cabinet is opened on both sides - front and back, wit a two-sided canopy on the top protecting against rainfall and against the excessive heat from the sun. Cabinet doors are locked with a bolt and a key typical for RTC equipment (square key), and the bolt is blocked additionally with a patent lock. On the inside, the cabinet is fitted with thermal insulation of PU foam. Inside of the cabinet free and (fan) forced air circulation is provided. In the bottom section, the cabinet is fitted with cable glands through which cables are led into the cabinet. The cabinet is resting on concrete footing (by MONAT) which is part of the delivery.

SPECIFICATIONS

Parameter	Value	Notes
Supply voltage	230 V (+10% - 15%) 50 Hz	
Max. input power from the grid	800 VA	
Level crossing UPS	24 DC,	Battery bank 65 Ah / 12 V or 85 Ah / 12 V
Device operation time upon failure in power supply 230 V / 50 Hz	Min. 24 h/100 pairs of trains	
Electrical strength of insulation	2 kV AC	
Ambient temperature range	- 40°C to +70°C	
Cabinet dimensions (W/H/D)	700 mm / 1150 mm / 640 mm	
Cabinet weight	Up to 100 kg	without battery
Early warning time	0 to 30 s.	factory adjusted
Relative humidity	(0 to 85) %	

DESIGNATIONS OF SZOR CABINETS

Type	Designation with digits	Meanings of individual digits		
SZOR	1st digit	1	Supply voltage of boom barriers 24 VDC	
		2	Supply voltage of boom barriers 230 VAC	
	2nd digit	0	Complete cabinet equipment suitable for controlling gate machines, signals, acoustic generator and boom barrier lights.	
		1	Cabinet equipment suitable for controlling gate machines, acoustic generator and boom barrier lights (no road signals).	
	3rd digit	1	Controlling one pair of gate machines	
		2	Controlling two pairs of gate machines	
	4th digit	0	Cabinet without road signals	
		2	Control of 2 road signals	
		3	Control of 3 road signals	
		4	Control of 4 road signals	

Example: The cabinet SZOR 1024 is suitable for controlling two pairs (4 pcs.) of gate machines with supply voltage 24VDC, acoustic generator, boom barrier lights and four road signals.

The equipment of SZOR cabinet comprises:

- concrete foundations and slabs,
- manipulator MR,
- batteries,
- power supply unit (the quantity depends on cabinet model),
- earth pin.

A photo of cabinet SZOR interior, as seen from the front part (control and monitoring section of the cabinet)

Barrier boom manipulator type MR (for SZOR)

The manipulator by MONAT is a control and monitoring device of the level crossing system UP-1. The manipulator is in the form of metallic box, dimensions 200x200x100, suitable for installation on wall-mounted or floor-mounted brackets. It may be also placed on the tabletop or on operator's desk. The device is powder coated in beige colour. In standard execution it is designated for indoor installation. The manipulator for outdoor installation is enclosed in additional housing (a box) protecting it against adverse weather conditions (rain, snow, etc.).

The manipulator is fitted with pushbuttons, switches and lamps, in quantities and configuration suiting the needs (the number of actuators).

DESIGNATIONS OF MANIPULATORS FOR SZOR CABINETS

Designation consists of letter symbol „MR" and numeric symbols - three digits.

Type	Designation with digits	Meanings of individual digits			
MR	1st digit	0	Standard execution		
		1	Special executions		
	2nd digit	1	Controlling one pair of gate machines		
		2	Controlling two pairs of gate machines		
	3rd digit			0	No road signals
				2	Controlling 2 road signals
				3	Controlling 3 road signals
				4	Controlling 4 road signals
				5	Controlling 5 road signals
				6	Controlling 6 road signals

Designations of manipulators for SZOR and SPR, SPM cabinets do differ!

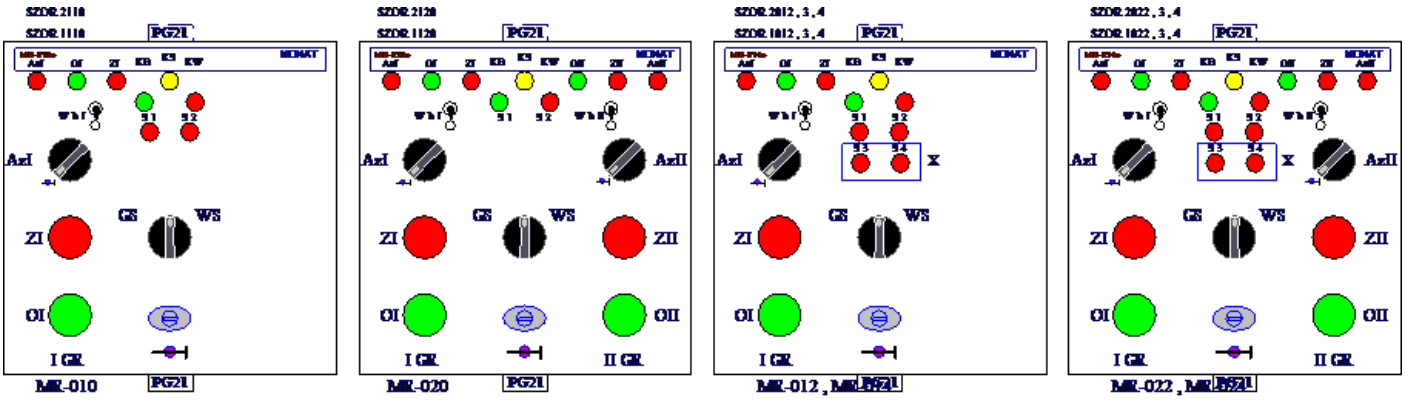
INSTALLATION METHOD FOR THE MANIPULATOR MR

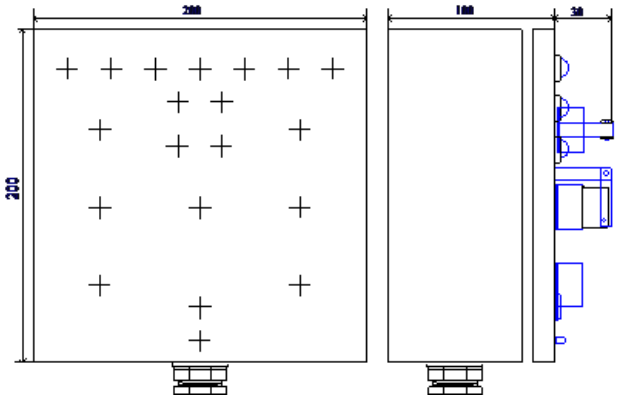
Installation method of depends on selected installation site.
Indoors, the manipulator MR may be installed on floor-mounted indoor bracket (dwg to the right), directly on the wall, using suitable bolts, and on the desktop, resting on dedicated base.
Outdoors, the manipulator MR should be be installed in outdoor housing (dwg to the right) which is then attached to the support driven to the ground.

The manipulator on indoor support

The manipulator in the housing on outdoor support

MANIPULATOR FRONT SURFACE IS SUITABLE FOR MATING WITH SZOR CABINETS





DESCRIPTIONS OF LAMPS, PUSHBUTTONS AND SWITCHES ON THE MANIPULATOR MR

lamps	Symbol	Colour	Description	Notes
Lamps	IC	yellow, continuous	Power grid 230 VAC voltage check	grid on
		yellow, flashing	SZOR cabinet door opening check and/or absence of voltage in 230 VAC grid	door open and/or absence of voltage in 230 VAC grid
	O	green	Boom barrier top position check	when the light is on, the boom barrier is in its top extreme position.
	Z	red	Boom barrier bottom position check	when the light is on, the boom barrier is in its bottom extreme position.
	AZ	red	Emergency closing of boom barrier circuit check	the lamp emits continuous light when the emergency closing circuit of boom barrier is functional, and goes off when the pushbutton "AZ" is depressed.
	S	red	Repeater of road signal lights. Only flashes when the road signal is on (normal operation).	the lamp goes off or emits continuous light when signals are on, which means a failure in operation of the signal or the equipment; the number of repeaters corresponds with the number of road signals at level crossing.
	Wb	White	"Wb" switch position check	The light is on which means the position of typhon switch is correct
Buttons	O	green	Designed for opening of boom barriers. In the event that two pairs of gate machines are controlled at the level crossing, roman numerals designations are added, i.e. OI and OII.	unstable button
	Z	red	The system is designed for closing of boom barriers. In the event that two pairs of gate machines are controlled at the level crossing, roman numerals designations are added, i.e. ZI and ZII.	unstable button
Switches	AZ	black	Designed for emergency closing of boom barriers. The lead seal serves to control the use of this switch.	unstable, double throw switch, sealed
	WS/GS	black	Designed for emergency switching on and off of signal lights and boom lights. The lead seal serves to control the use of this switch.	triple throw switch, stable, red colour, sealed
	Wb	Silver	Designed to deactivate the manipulator typhon.	Double throw switch, stable

Indoor mounting bracket for the manipulator MR

View of the indoor mounting bracket for the manipulator MR

The mounting bracket is designed for mounting of the manipulator MR inside of premises. The mounting bracket is executed in steel pipe, ensuring suitable mechanical strength, welded to the base which is mounted to the floor with four bolts. The mount of the manipulator is so executed as to make sure the manipulator is positioned in such a manner that is does not inhibit reading of parameters when standing. The manipulator is in slightly inclined position, which facilitates operation of pushbuttons and switches and ensures best possible reception of light signals from the manipulator. All the structure is powder coated.

Parameter	Value
Depth	200 mm
Width	200 mm
Height	1025 mm
Weight	7,75 kg

Outdoor mounting bracket for the manipulator MR

View of the manipulator in the housing on outdoor mounting bracket

Outdoor mounting bracket for the manipulator MR is used when the control manipulator has to be installed outdoors, in direct vicinity of the level crossing. Such a situation occurs when level crossing automation is activated by train crew. In such case thee is a need for securing the manipulator MR, in particular its sensitive parts, against the effect of weather conditions.

EXECUTION

Outdoor mounting bracket for the manipulator MR is in the form of metal box fitted with a door, with the manipulator installed inside. The box is secured against tampering with a patented lock and holder on which a padlock can be installed to further secure the box. All the assembly is mounted on the bracket - foundation built in the ground. The bracket has a special inlet to enable insertion of connecting cable to the manipulator MR below the ground level. Both the housing and the mounting bracket - foundation are coated to ensure protection against corrosion due to weather conditions.

The view of mounting bracket footing

Parameter	Value
REGULAR HOUSING	
Depth	180 mm
Width	304 mm
Height	365 mm
Weight	5.5 kg
EXTENDED HOUSING	
Depth	180 mm
Width	364 mm
Height	365 mm
Weight	7 kg
SUPPORT BRACKET - FOOTING	
Depth	130 mm
Width	400 mm
Height	2110 mm
Weight	18.85 kg

Switched-mode power supply assembly for lights ZZI-01/L

A photo of finished switched-mode power supply assembly for boom barrier lights type ZZI-01/L

Switched-mode power supply assembly is designed to control boom barrier lights , as the component of SZOR cabinet equipment.

OPERATING PRINCIPLE

On depressing the „Close" button on the manipulator, lights on boom barriers are switched on. Lights are flashing and dimming, simultaneously. Foe easy identification of failures, there are three LEDs on the assembly housing notifying as follows:

- functioning of internal PSU - green LED,
- correct operation of the assembly - red LEDs, flashing.

SPECIFICATION

Parameter	Value	Notes
Supply voltage	20 – 30 VDC	rated 24 VDC
Driving power	60 W	Incandescent light type LŻp 24 VDC 10 W – max. 6 pcs LED light type LDc / LDcU 24 VDC – max. 24 pcs.
Impulse frequency	~1 Hz	50 – 70 pulses per minute
Dimming depth of light bulbs	down to 75% rated power	
Working temperature	-30˚C to +40˚C	
Method of installation	10 bolts M4, to cabinet structure	

Swiched mode power supply assembly for signals ZZI-11/S and ZZI-11/S LED

A photo of the finished switched-mode power supply assembly for signals ZZI-11/S

Switched-mode power supply assembly is designed to control light bulbs (ZZI-11/S) and LED matrices (ZZI-11/S LED) in road signals, as the component of SZOR cabinet equipment.

OPERATING PRINCIPLE

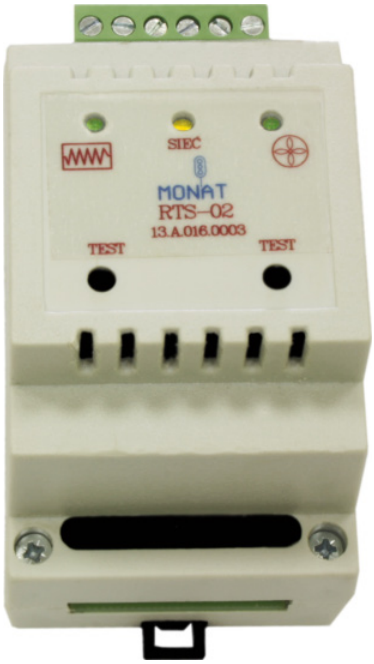
On depressing the „Close" button on the manipulator, lights on road signals are switched on. Lights are flashing and dimming, alternately. Foe easy identification of failures, there are three LEDs on the assembly housing notifying as follows:

- function of internal PSU - green LED,
- correct operation of the assembly - red LEDs, flashing.

SPECIFICATION

Parameter	Value	Notes
Supply voltage	20 – 30 VDC	rated 24 VDC
Driving power - channel A	serialy connected light bulbs 12V/24W - 2 pcs. serialy connected LED matrix 12V/12W - 2 pcs.	
Driving power - channel B	serialy connected light bulbs 12V/24W - 2 pcs. serialy connected LED matrix 12V/12W - 2 pcs.	
Impulse frequency	~1Hz	50 – 70 pulses per minute
Dimming depth of light bulbs	Down to 75% rated power	
Working temperature	-30˚C to +40˚C	
Method of installation	10 bolts M4x10, to cabinet structure	

Temperature governor RTS-02 in the equipment cabinet



A photo of temperature governor RTS-02

RTS-02 - a device suited for connection of a heater and a fan. Maintains temperature in the range between +8°C and 32°C inside the equipment cabinet (used in SZOR cabinets).

SPECIFICATIONS

Parameter	Value
Supply voltage	230 VAC
Fan protection	1:00 AM
Heater protection	2:00 AM
Heater supply voltage	230 VAC
Fan power supply	230 VAC
Dimensions [H x W x D] mm	50 x 130 x 110
Mount	Strip TS 35