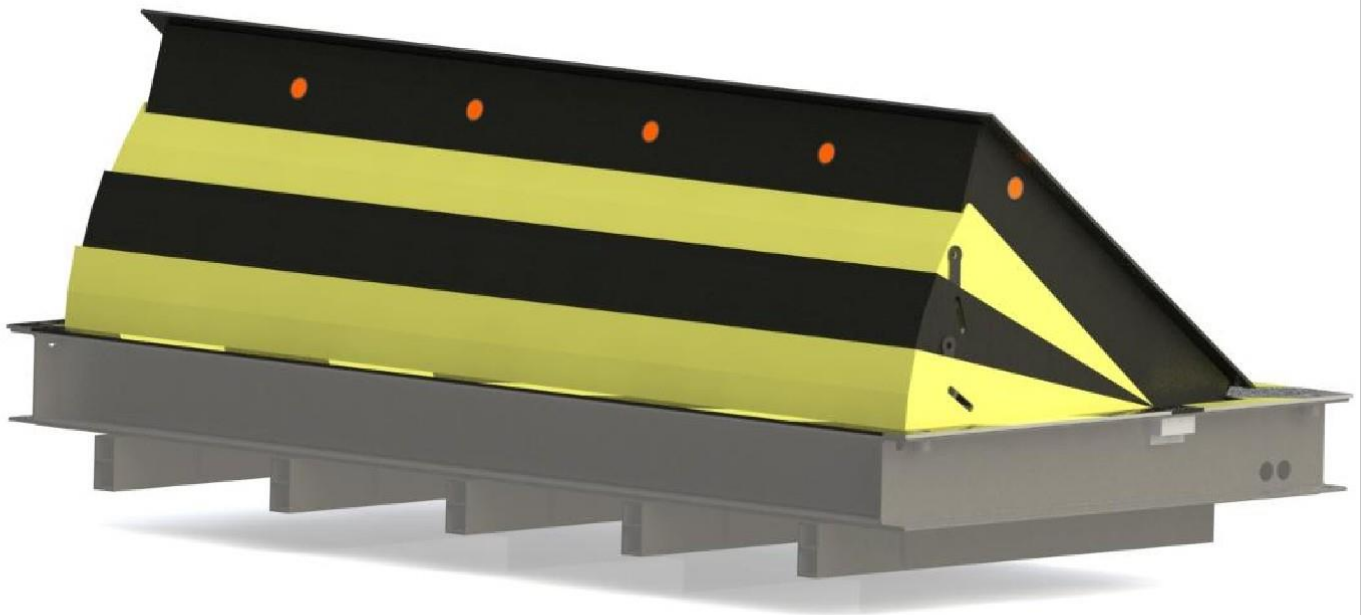


Original instructions

OPERATING MANUAL. PART I

Automatic Antiramming Road Blocker Installation M30, M40, M50



ROAD BLOCKING SYSTEMS

Antiramming Road Blocker

Contents

Contents:

1. General Guidelines	4-5
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The Manual is provided for joint use with the **Operation Manual. Part II. Wiring of Road Blockers (RB series)**

Annex 1 DD for reinforcement cage manufacturing and installation.



The following abbreviation are used in this Manual:

- M - Maintenance;
- HU - Hydraulic Unit;
- HC - Hydraulic Cylinder;
- R.s.l - Road surface level (reference point ± 0.000).



- This manual is an integral part of the product and shall be handed over to the customer. The manual shall be kept for future use and to be consulted, if appropriate.
- If the road blocker is resold, handed over to another owner or transported to another place, make sure that this manual is enclosed to the product to be used by new owner and/or maintenance staff during installation and/or operation

ROAD BLOCKING SYSTEMS



1. Safety General Guidelines



The Manual should be scrutinized prior to the equipment installation and operation to ensure safety of people. Improper operation or use don't ensure safety.

- *The Company "TiSO" does its best to provide surety and accuracy of this Manual and reflect substantial design modifications. Continuous improvement may cause little differences between the equipment to be supplied the description herein.*
- *The Manual to be kept for future use.*



The personnel servicing operating electrical installations or performing their adjustment, wiring, repair, maintenance and installation shall be trained to handle the relevant model! Training shall be performed by the product manufacturer or product manufacturer's representatives!

- *Operating equipment to be beyond the reach children and outsiders. The manufacturer shall not be liable for violation of safety rules.*



In case of improper operation and noncompliance with requirements of instruction manuals the road blocker may constitute a danger to life and health of people by presence of increased voltage in electric circuits and movable parts!! The product to be transported in only down state!

- *Any actions that are not explicitly specified in this Manual are prohibited.*
- *Safety devices provide security of potentially hazardous areas.*

Antirammung Road Blocker

1.1 Instructions to installer:

1. The equipment installation instructions shall be complied with for the purpose of safety.
2. The road blocker shall be installed according to the code of practice in compliance with safety regulations for installation.
3. The equipment shall be installed when it is deenergized.
4. Packing materials are subject to disposal according to the applicable standards.
5. The road blocker installation procedure, specified in the Manual, shall be strictly observed.



- It is forbidden to modify the equipment configuration and to use materials and components being outside the scope of delivery and not specified by this Manual.
- It is forbidden to install equipment during thunderstorm, heavy rain or snowfall, in explosive environment and obscured conditions.
- Installation area shall be prepared according to the applicable standards.



- **The road blocker shall be installed, connected and precommissioned by qualified professionals.**

6. When faults or defects are detected, the Supplier's service department shall be referred to;
7. The installer shall provide the user with the required information on operation of the system in manual mode in case of emergency
8. The manufacturer shall not be liable for the equipment operation in the following events:
 - noncompliance with installation procedure;
 - use of nonstandard materials and components;
 - performance of work by unqualified personnel.
9. The manufacturer shall not be liable for compliance with safety measures during installation of equipment by the personnel outside the Company's service department.

ROAD BLOCKING SYSTEMS



Antirammung Road Blocker

1.2 Instructions to user:

1. The operation regulations, prescribed by this Manual, shall be strictly observed.
2. No modifications of the equipment components shall be made.
3. The equipment shall be used for intended purposes, specified by the manufacturer.
4. Don't try to repair or adjust the road blocker on your own. The relevant service department shall be referred to. Breaking of seals shall cancel the manufacturer's warranty liabilities.
5. The road blocker control units (panels) shall be beyond the reach of outsiders.

6. The manufacturer shall not be liable for improper operation of equipment and violation of safety measures by the user.



- The Road Blocker must be installed, precommissioned and serviced by certified professionals having the relevant qualification and being familiar with the product design and instruction manuals:

- installation and operation manual (Part I, Part II);
- datasheet;
- instruction manuals for components.

- Technical inspections, maintenance, adjustment and repair shall be performed only when the road blocker is deenergized.

- The device, designed and manufactured in accordance with directives of the European Union, shall be marked according to CE standards



Make sure of availability of the plate with manufacturer's details:

TISO		TISO 72, Yamska Str. 03680 Kyiv, Ukraine
Model:	<input type="text"/>	
Model Code:	<input type="text"/>	
Type:	<input type="text"/>	
Serial №:	<input type="text"/>	
Power supply:	<input type="text"/> V	
Current:	<input type="text"/> A	
Weight:	<input type="text"/> kg	
Frequency:	<input type="text"/> Hz	
Protection class:	<input type="text"/>	
Power:	<input type="text"/> kW	
Manufacturing date:	<input type="text"/>	Made in Ukraine

ROAD BLOCKING SYSTEMS



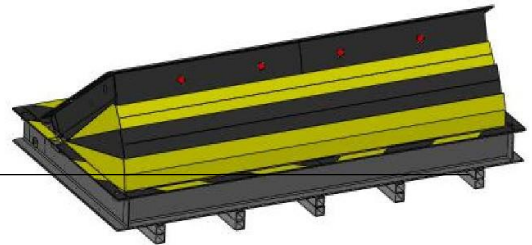
Antiramming Road Blocker

2. Product Description

Sunk



Raised



2.1 The automatic antiramming road blocker with hydraulic actuator is a static platform with built-in barrage element (raising platform).

In down position the road blocker obstructs the vehicle access to the protected area (site).

In up position the barrage platform prevents unauthorized vehicle access.

Index of assured protection - ASTM F 2656 -07 M30, M40, M50 (K4, K8, K12).

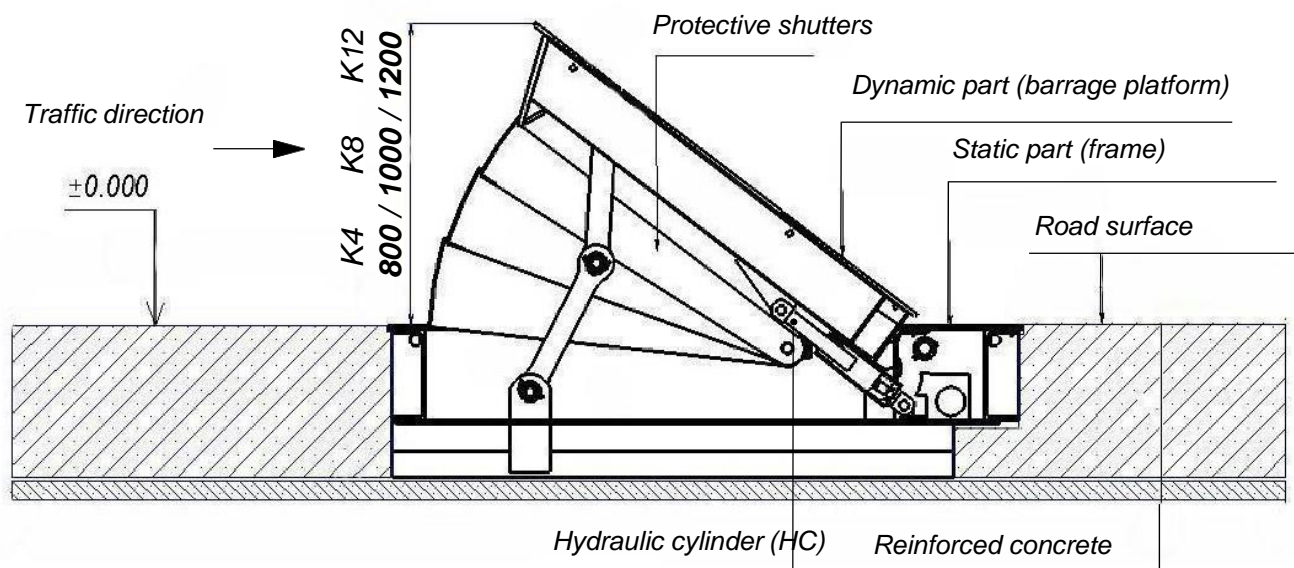
2.2 Coating - warning paint; (Option 1: black and yellow. Option 2: red and white);

2.3 Hydraulic actuator with external hydraulic (fluid) unit;

2.4 The road blocker can be controlled:

- from wire or wireless remote control panel
- automatically via access control system;
- manually (manual sinking in case of power failure).

Independent control of two road blockers with one control unit and parallel (simultaneous) group control of more than two road blockers are allowed.



ROAD BLOCKING SYSTEMS



Antirammung Road Blocker

3. Purpose

3.1 The road blockers are used at public, commercial and private facilities for unauthorized vehicle access control, vehicular traffic management and regulation at different sites and adjacent areas.

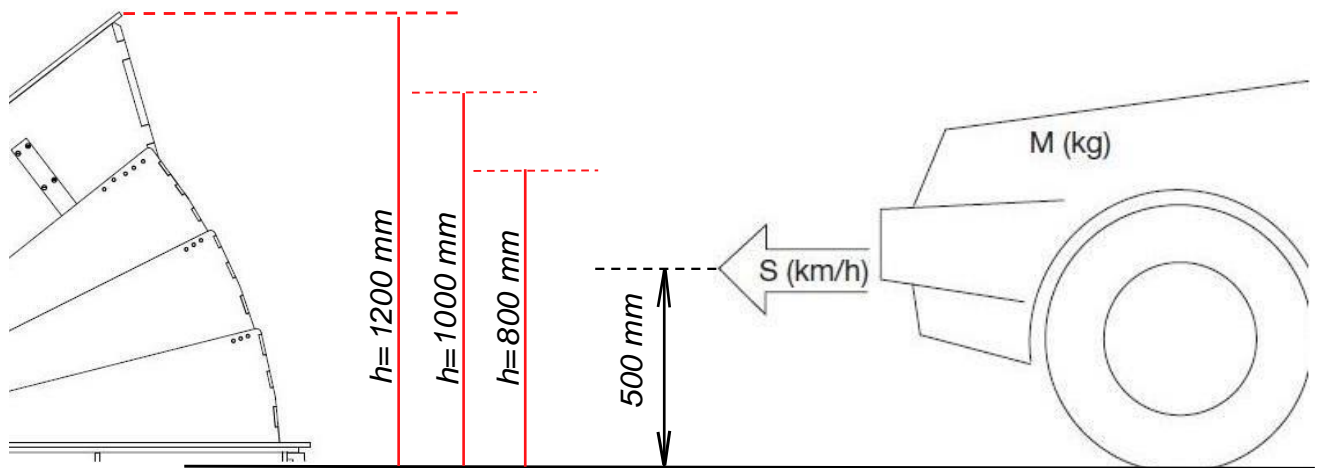
3.2 The road blockers are recommended for passenger transport facilities, approaches to sports facilities and government facilities, to be installed in front of shops, hotels, shopping malls and office centers, health care facilities, at the approaches to cottages and cottage settlements, at central urban and historical sites, industrial and special facilities.

3.3 The road blockers can be installed in conjunction with other traffic control and unauthorized access prevention equipment.

3.4 By impact of environmental factors the road blocker complies with EN 300 019-1-4 and is designed for operation in moderate climate (class 4.1) with acceptable ambient temperature -33°C to $+40^{\circ}\text{C}$.

3.5 The road blocker index of assured protection complies with the standard ASTM F 2656-07

Standard	Mass, M (kg)	Speed, S (km/h)	Barrage platform lift height, h (mm)
M30 (K4)	6,8	48	800
M40 (K8)	6,8	64	1000
M50 (K12)	6,8	80	1200



ROAD BLOCKING SYSTEMS



Antirramming Road Blocker

3.6 Certificates

The products AUIA-313 and AUIA-333 have been successfully tested (crash test) within the certification system ASTM F 2656-07 in class:

- M30 for the road blocker AUIA-313

- M50 for the road blocker AUIA-333



Contracting Client:
Tiso Blockers, LLC
72, Yamska str.
03150 Kyiv
Ukraine



Contracting Client:
Tiso Blockers, LLC
72, Yamska str.
03150 Kyiv
Ukraine

Certificate

of passed Barrier Testing Programme

ASTM F 2656-07, M30, 22 nd October 2015, CTS Test-No: 18250	
Type of product:	Road Blocker „AUIA – 313“
Vehicle penetration:	-2.1 m (dynamic)
Mass [Target]:	6800 kg (±140 kg)
Mass [Test]:	6850 kg
Impact speed [Target]:	50.0 km/h (45.0 km/h – 60.0 km/h)
Impact speed [Test]:	49.6 km/h
Angle:	90 °
Major debris:	n/a (≥ 25 kg)
Observations	
Vehicle restrained:	yes
Vehicle immobilized:	yes
Road Blocker still functions after impact:	yes
Penetration Rating:	P1 (-2.1m)

Certificate

of passed Barrier Testing Programm

ASTM F 2656-07, M50, 14 July 2015	
Type of product:	„AUIA – 333 Automatic“
Vehicle penetration:	-2.4 m (dynamic)
Mass [Target]:	6800 kg (±140 kg)
Mass [Test]:	6855 kg
Impact speed [Target]:	80.0 km/h (75.1 km/h – above)
Impact speed [Test]:	83.5 km/h
Angle:	90 °
Major debris:	n/a (≥ 25 kg)
Observations	
Vehicle restrained:	yes
Vehicle immobilized:	yes
Road Blocker still functions after impact:	yes
Penetration Rating:	P1 (-2.4m)

Sincerely,

Dipl.-Ing. Peter Schimmelpfennig
(Managing Partner)

Amelunxenstraße 30, 48167 Münster, Germany

www.crashtest-service.com

Sincerely,

Dipl.-Ing. Peter Schimmelpfennig
(Managing Partner)

Amelunxenstraße 30, 48167 Münster, Germany

www.crashtest-service.com



ROAD BLOCKING SYSTEMS



72 Yamska str., Kyiv 03680, Ukraine, Tel.:+380 (44) 461-79-69, Fax:+380 (44) 586-46-51
www.tiso.global e-mail: sales@tiso.global

Antiramming Road Blocker

4. Technical Features

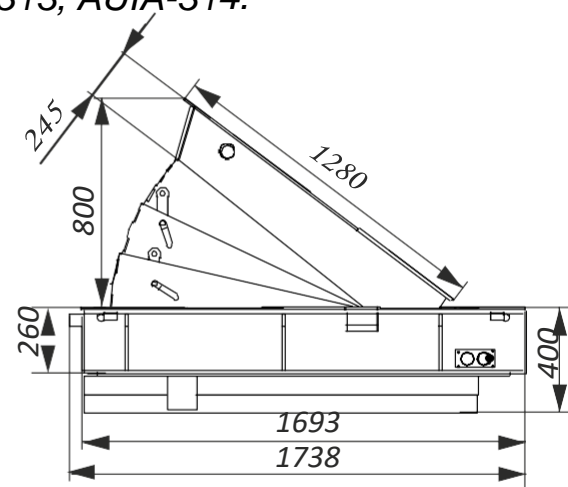
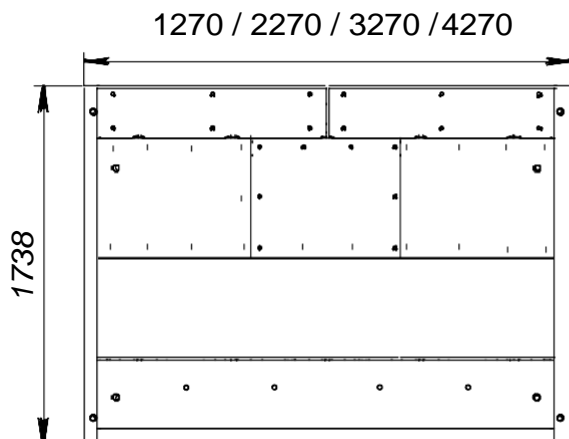
Road blocker model	Travel length, mm	M30 (K4)	M40 (K8)	M50 (K12)
	L=1000	AUIA-311	AUIA-321	AUIA-331
	L=2000	AUIA-312	AUIA-322	AUIA-332
	L=3000	AUIA-313	AUIA-323	AUIA-333
	L=4000	AUIA-314	AUIA-324	AUIA-334
Installation type	submersible	submersible	submersible	
Actuator type	hydraulic	hydraulic	hydraulic	
Actuator location	external (internal)	external (internal)	external (internal)	
Barrage platform lift height, mm.	800	1000	1200	
Access blocking width, m				
L=1000	1	1	1	
L=2000	2	2	2	
L=3000	3	3	3	
L=4000	4	4	4	
Overall dimensions, mm.				
L=1000	1270 x 1738 x 400	1200 x 1913 x 500	1320 x 2360 x 600	
L=2000	2270 x 1738 x 400	2200 x 1913 x 500	2320 x 2360 x 600	
L=3000	3270 x 1738 x 400	3200 x 1913 x 500	3320 x 2360 x 600	
L=4000	4270 x 1738 x 400	4200 x 1913 x 500	4320 x 2360 x 600	
Maximum axle weight limit, t	15	15	15	
Material	structural steel	structural steel	structural steel	
Impact resistance, kJ	650,2	1110	1843,9	
Raising time, s	3,4 (1,5 c EFO)	3,6 (1,6 c EFO)	3,9 (1,8 c EFO)	
Sinking time, s	2	2	2,5	
Power supply	3-phase ~ 380V, 50/60Hz	3-phase ~ 380V, 50/60Hz	3-phase ~ 380V, 50/60Hz	
Maximum power consumption				
L=1000	1,5 kW	3 kW	3 kW	
L=2000	3 kW	3 kW	5,5 kW	
L=3000	4 kW	4 kW	7,5 kW	
L=4000	5,5 kW	7,5 kW	9,5 kW	
Road blocker index of protection	IP 67	IP 67	IP 67	
Control box index of protection	IP 54	IP 54	IP 54	
Weight, kg				
L=1000	~ 1500	~ 1700	~ 1520	
L=2000	~1800	~2100	~ 2250	
L=3000	~ 2100	~ 2500	~ 3190	
L=4000	~ 2800	~ 3300	~ 4200	
Temperature conditions, C	-10 /50	-10 /50	-10 /50	
Heating system temperature conditions (optional), C	-30 /50	-30 /50	-30 /50	
Light indication	built-in LEDs			
Raised position locking	hydraulic unit hydraulic lock			
Manual emergency sinking	manual release mechanical device			
Operating mode	intensive			

ROAD BLOCKING SYSTEMS

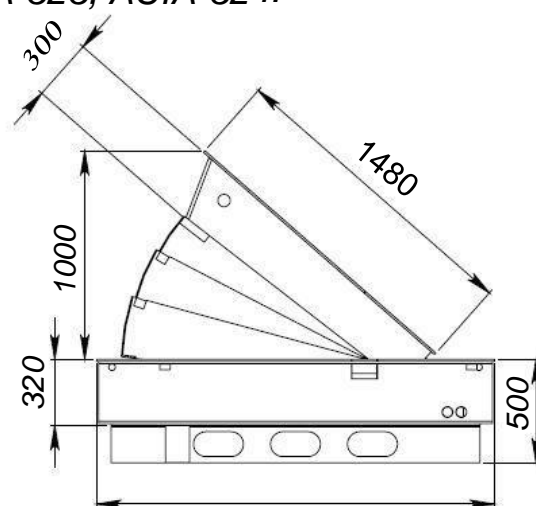
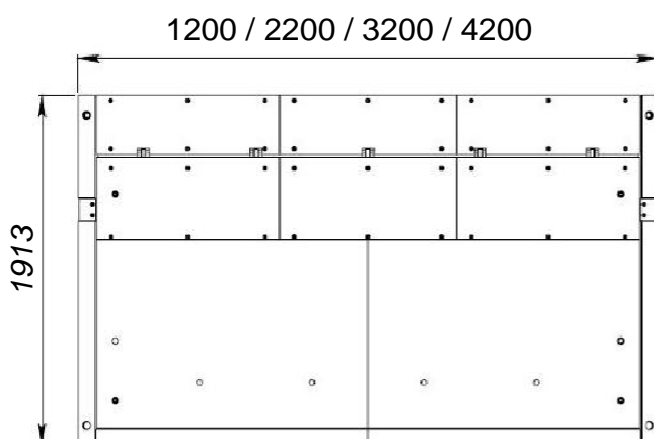


Antirammung Road Blocker

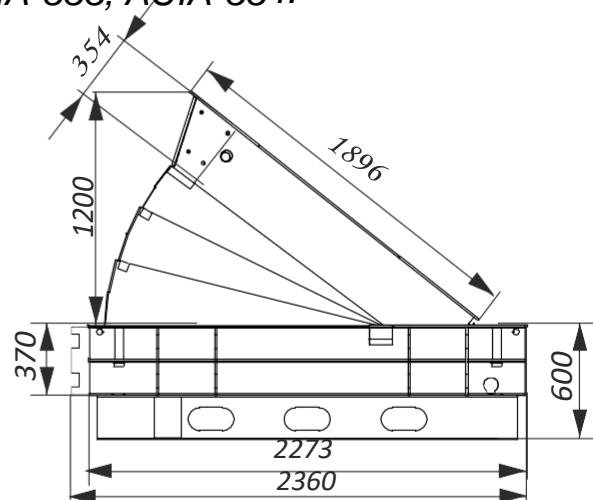
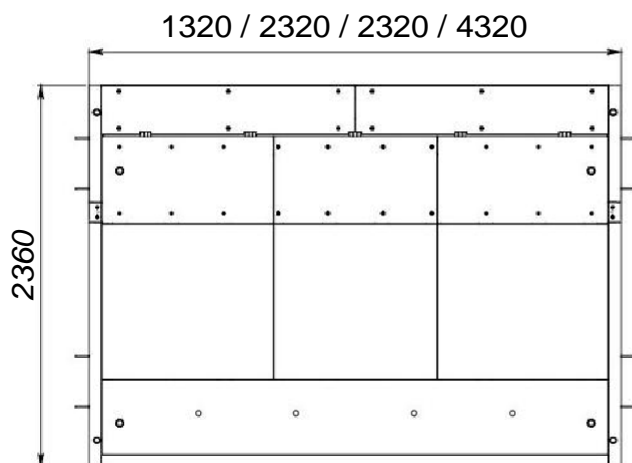
- Road Blocker dimensions K4 (M30) - AUJA-311, AUJA-312, AUJA-313, AUJA-314.



- Road Blocker dimensions K8 (M40) - AUJA-321, AUJA-322, AUJA-323, AUJA-324.



- Road Blocker dimensions K12 (M50) - AUJA-331, AUJA-332, AUJA-333, AUJA-334.



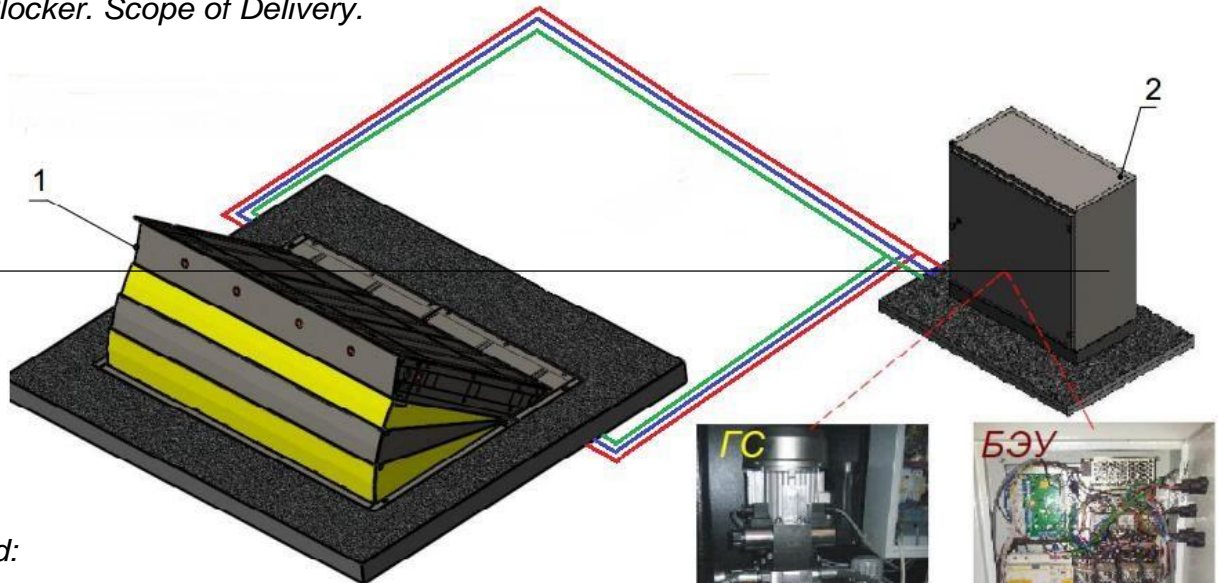
ROAD BLOCKING SYSTEMS



Antirammung Road Blocker

5. Product Specification

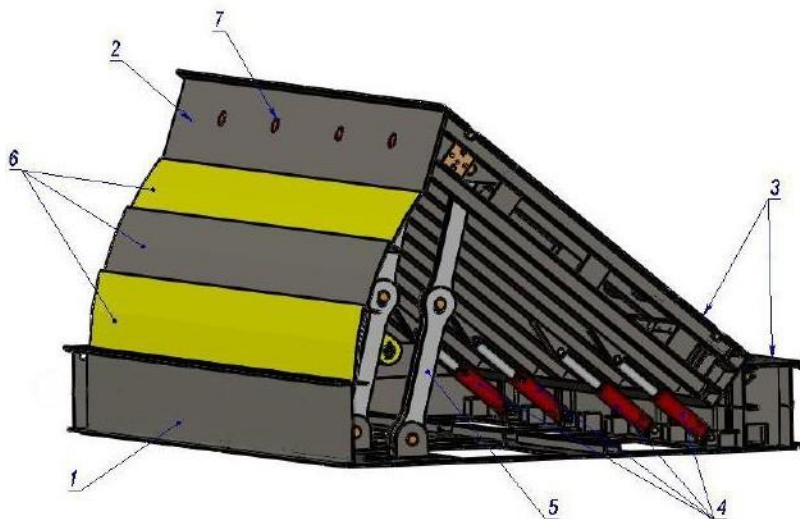
Road Blocker. Scope of Delivery.



Legend:

1. Road blocker assembly;
2. Control unit box (cabinet):
 - Hydraulic (fluid) unit (HU);
 - Box with electronic control unit (БЭУ).

Road Blocker major components.



Legend:

- Static part (frame);
- Dynamic part (raising platform);
- 3. Removable lids;
- 4. Hydraulic cylinder (HC);
- 5. Pivot mechanism;
- 6. Protective shutters;
- 7. LED lamps.

ROAD BLOCKING SYSTEMS

6. Road Blocker Installation

6.1 Arrangement of installation site:

- Arrangement of installation site must comply with requirements of applicable regulations and standards.
Installation area shall be fenced along perimeter with temporary security fencing or caution tape at the distance of 3 meters from the installation site.
- The appropriate warning signs ISO 7010: 2011 shall be installed in front of the entrance to the installation site.



- Make sure that there are no underground utilities at the installation site!
- Keep outsiders away from the installation site!
- Safety regulations must be observed during installation!

6.2 Installation sequence:

- Preparation of installation pit;
- Arrangement of concrete base (foundation);
- Installation of utility conduit;
- Installation of road blocker in the designed position;
- Installation of ramps in the designed position;
- Connection of utilities.

6.3 Installation procedure:

6.3.1 Preparation of installation pit:

1. The required marking according to the design solutions to be made;
2. The roadbed to be removed, if appropriate;
3. A pit to be dug (See dimensions **in Table 1**);
4. Geotextile to be put on the pit bottom;
5. The recommended water drain diagram is shown on page 22, p.7.1;
6. 50mm protective concrete layer to be poured (Concrete C30/37. ENV-206).
7. A ditch for installation of utilities of 600mm width and 600mm depth to be dug.

* - Water discharge into the existing sewage system or earth to be provided, if applicable.
Use of forced water discharge systems (pumps) is allowed.



- Concreting shall be performed according to the applicable standards;
- It is advised to use waterproof additives to obtain water-resistant concrete.

ROAD BLOCKING SYSTEMS

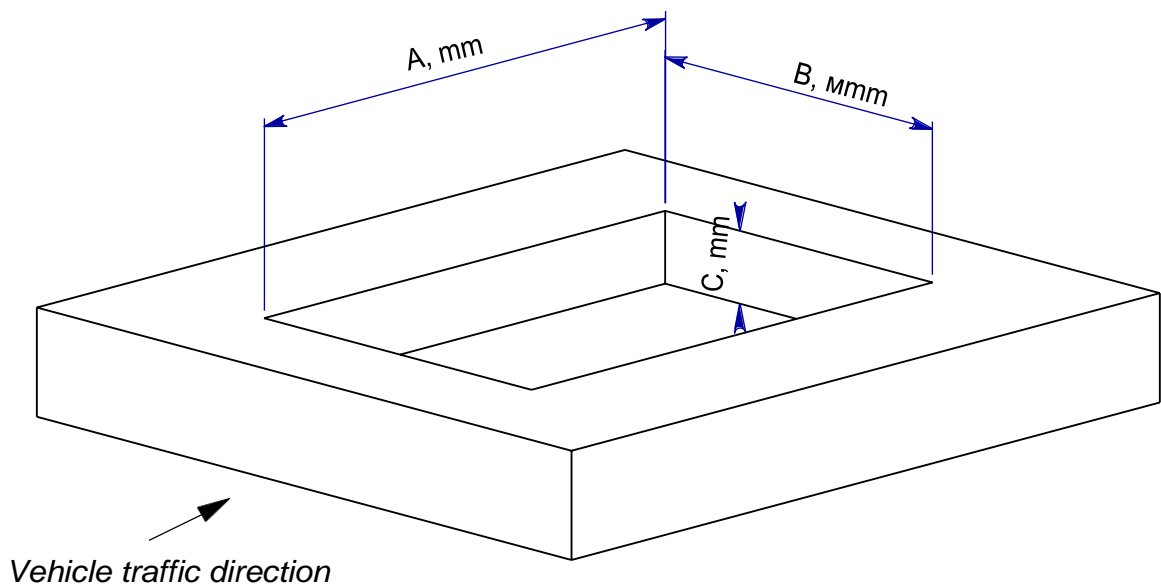
Antirammung Road Blocker

Table 1. Pit dimensions

Pit dimensions for the Road Blocker K4 (M30), h=800 mm	A, mm	B, mm	C, mm
L=1000 (for AUJA-311)	4200	2200	450
L=2000 (for AUJA-312)	4200	3200	450
L=3000 (for AUJA-313)	4200	4200	450
L=4000 (for AUJA-314)	4200	5200	450

Pit dimensions for the Road Blocker K8 (M40), h=1000 mm	A, mm	B, mm	C, mm
L=1000 (for AUJA-321)	4200	2200	550
L=2000 (for AUJA-322)	4200	3200	550
L=3000 (for AUJA-323)	4200	4200	550
L=4000 (for AUJA-324)	4200	5200	550

Pit dimensions for the Road Blocker K12 (M50), h=1200 mm	A, mm	B, mm	C, mm
L=1000 (for AUJA-331)	6500	2350	650
L=2000 (for AUJA-332)	6500	3350	650
L=3000 (for AUJA-333)	6500	4350	650
L=4000 (for AUJA-334)	6500	5350	650

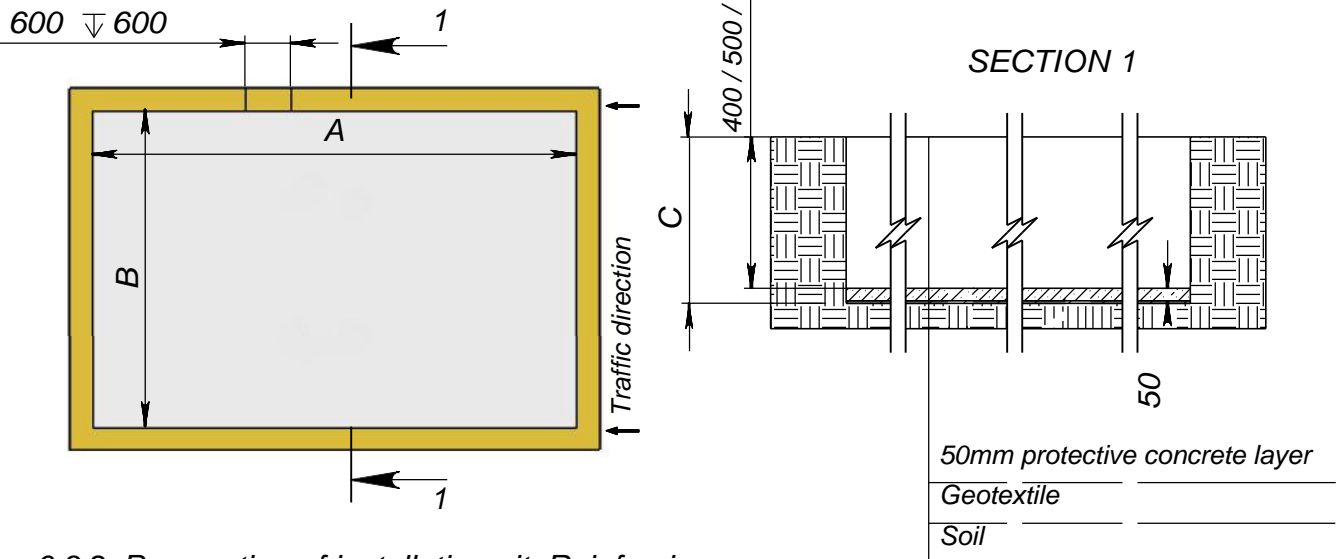


ROAD BLOCKING SYSTEMS



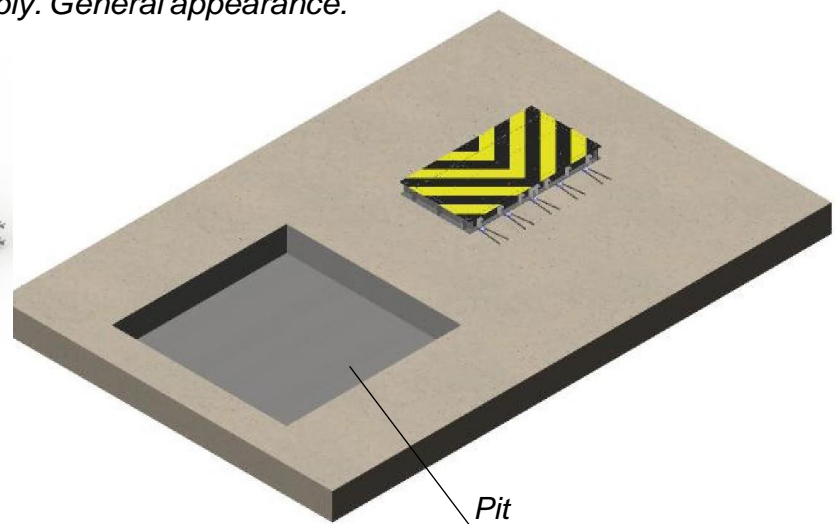
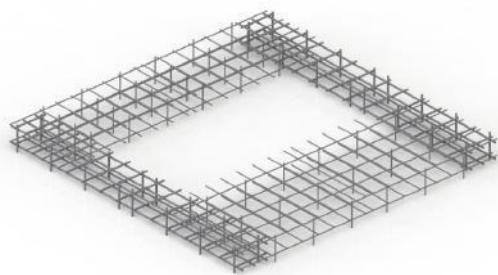
Antirramming Road Blocker

The Road Blockers K4 installation steps in the designed position (M30) K8 (M40) and K12 (M50)



6.3.2 Preparation of installation pit. Reinforcing.

Reinforcement cage assembly. General appearance.



- Road Blocker foundation installation design reference mark -0.400;
- Reinforcing shall be performed according to the applicable standards;
- Rebar shall be welded according to ISO 15614-7.



Reinforcement cage may be delivered as additional option along with the road blocker or can be manufactured by the site supervisor according to drawings of the company "TISO".

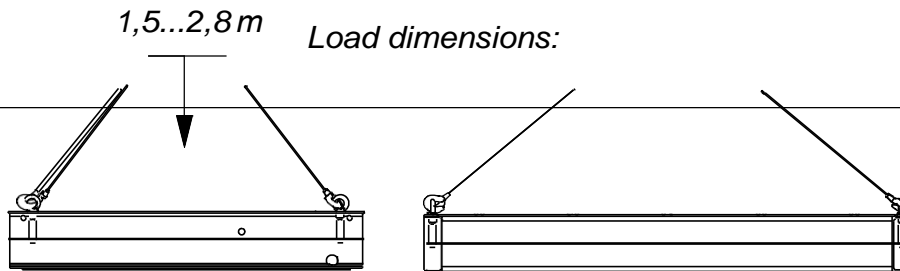
The reinforcement cage drawing is shown in Annex 2 to this Manual.

ROAD BLOCKING SYSTEMS

Antirammung Road Blocker

Sequence of operations:

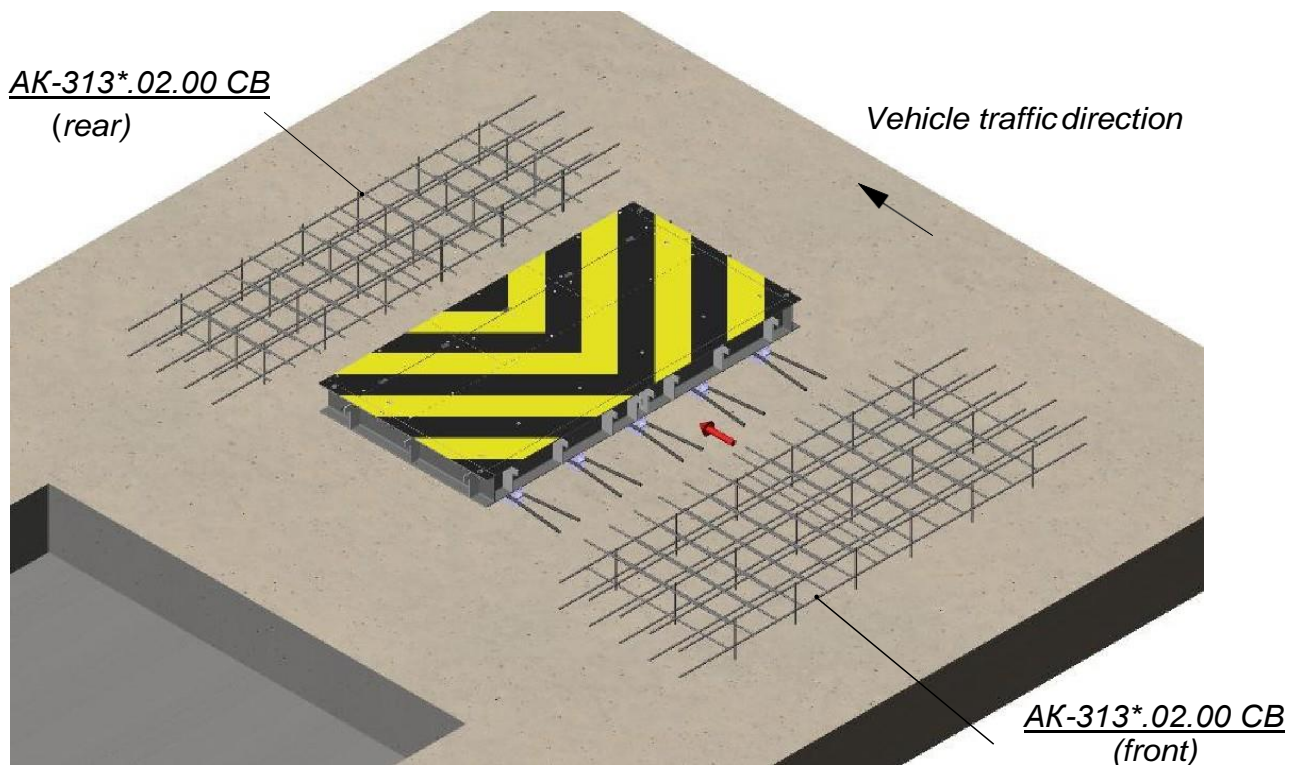
1. The product to be unpacked;
2. Outside condition and configuration of the road blocker to be checked;
3. Eye-bolts M30 to be installed;
4. The road blocker to be installed in the designed position by means of handling equipment.



The road blocker horizontal position according to compliance with the design reference marks shall be checked by means of leveling instrument. The roadbed level of the specified road section shall be taken as conventional ± 0.000 .

Step 1

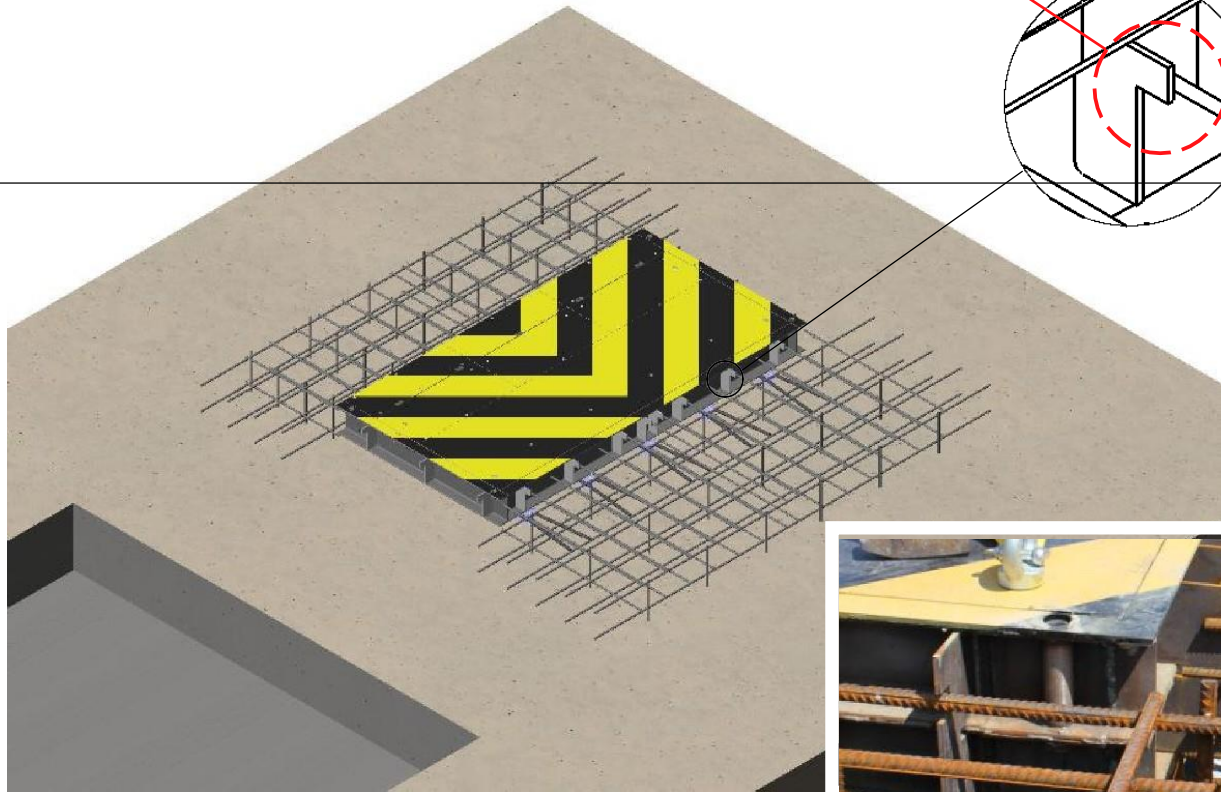
Connection of front (AK-313*.01.00 CB) and rear reinforcement cages (AK-313*.02.00 CB).



ROAD BLOCKING SYSTEMS

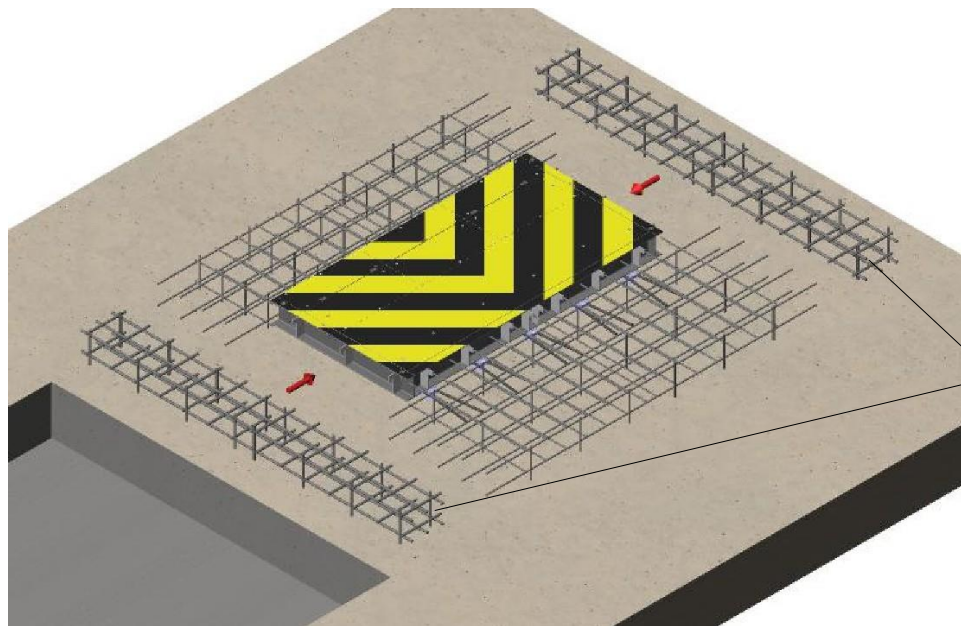
Antirammung Road Blocker

Every rib to be welded.



Step 2

Connection of side reinforcement cage - 2 pcs. (AK-313*.03.00 CB)



AK-313*.03.00 CB
(side)

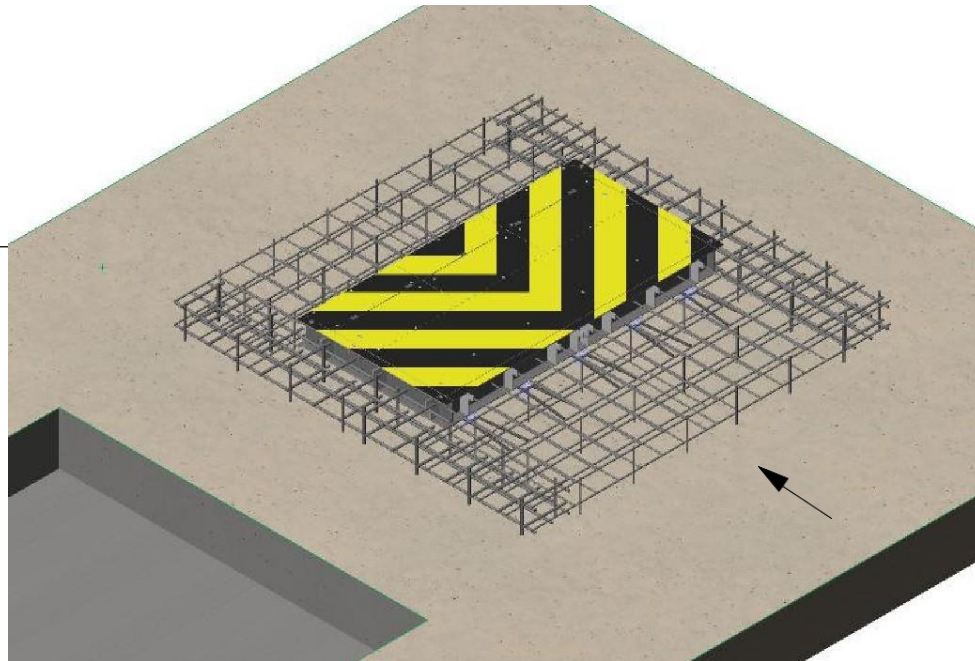
ROAD BLOCKING SYSTEMS



Antiramming Road Blocker

Step 3

Road Blocker to be installed in the designed position according to Annex 2.



Vehicle traffic direction



The whole structure of reinforcement cage and road blocker to be securely fixed (welded) to each other.



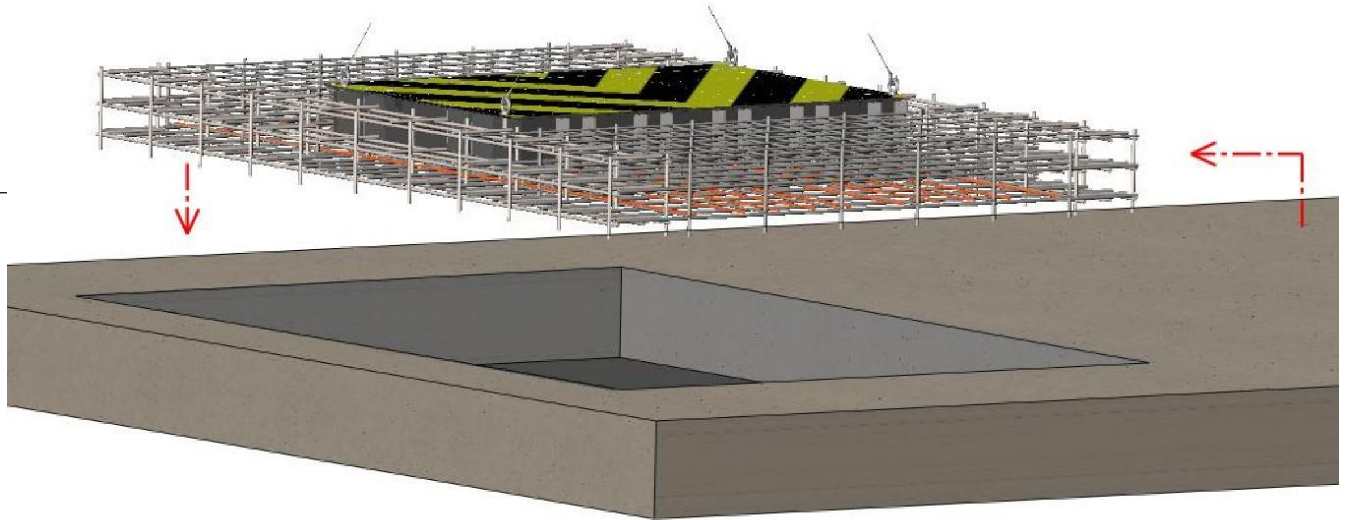
ROAD BLOCKING SYSTEMS



Antiramming Road Blocker

Step 4

The Road Blocker assembly along with reinforcement cage to be dropped into the prepared pit, See p. 6.3.

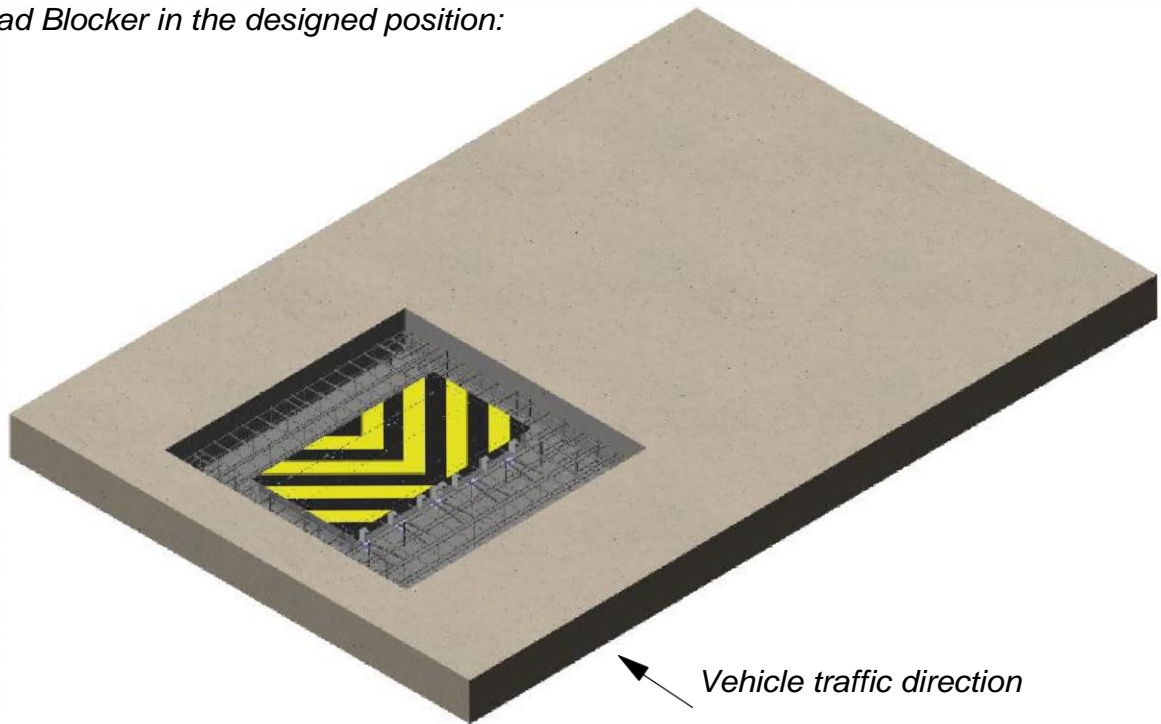


ROAD BLOCKING SYSTEMS



Antiramming Road Blocker

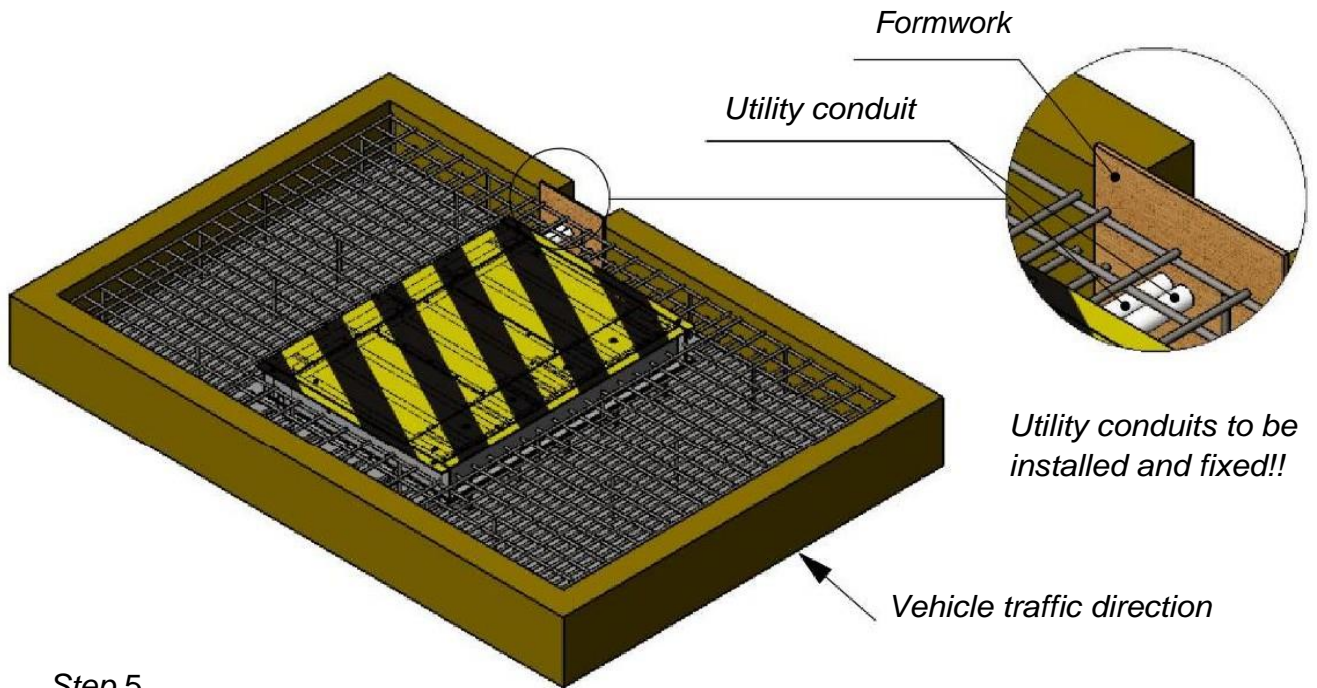
Road Blocker in the designed position:



ROAD BLOCKING SYSTEMS



Antirammung Road Blocker

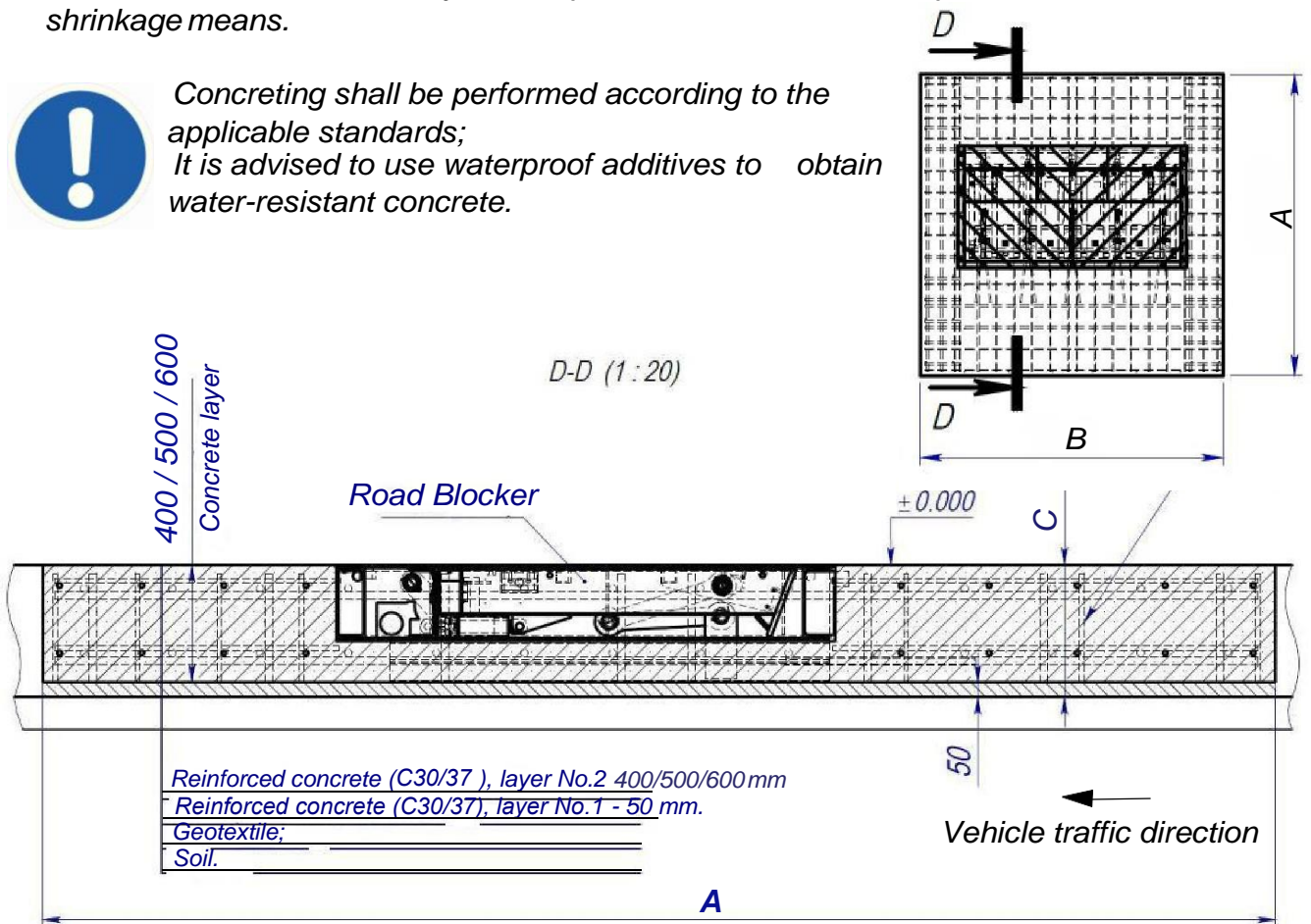


Step 5

400/500/600 mm concrete layer to be poured. Concrete shall be poured with the use of vibro shrinkage means.



Concreting shall be performed according to the applicable standards; It is advised to use waterproof additives to obtain water-resistant concrete.



ROAD BLOCKING SYSTEMS



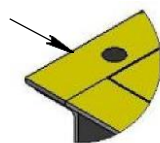
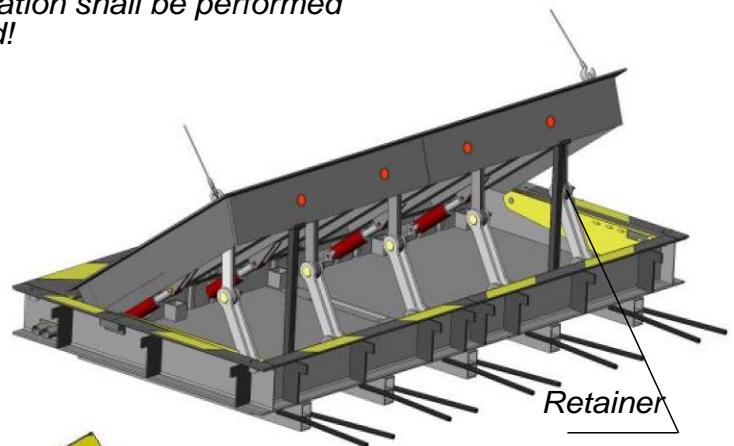
Antirammung Road Blocker



All operations on connection of the road blocker utilities and preparation of trial operation shall be performed only when retainers are fixed!

Safety Regulations shall be observed during performance of work! The raising barrage platform weight is 1000kg.

Eye-bolts to be unscrewed and removed and mounting holes to be covered with EPDM plugs upon completion of installation.



It is supplied complete with road blocker.

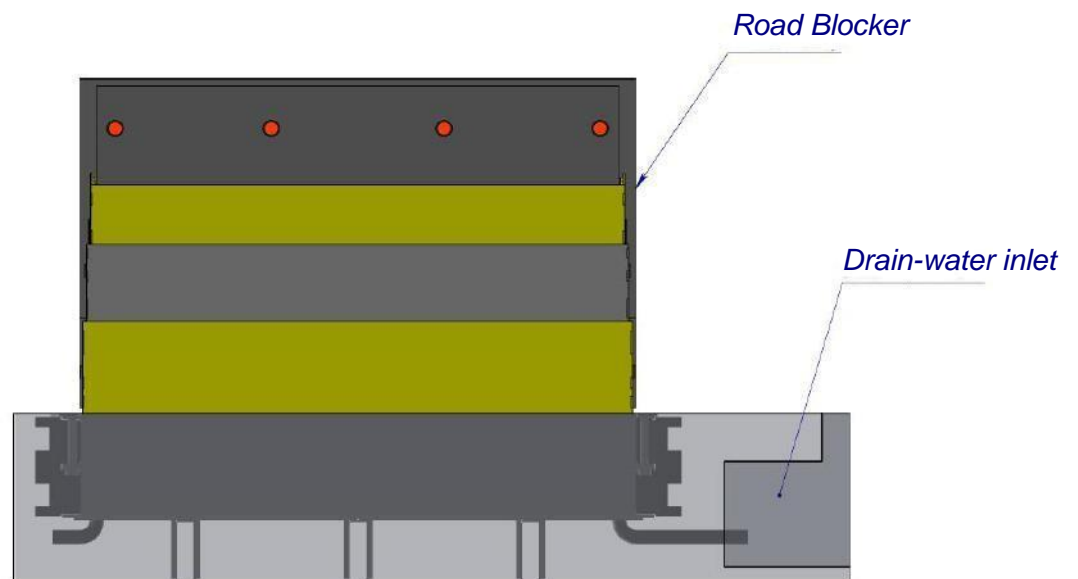
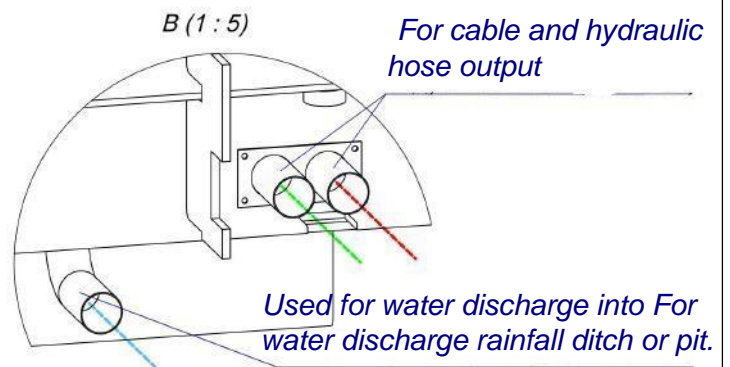
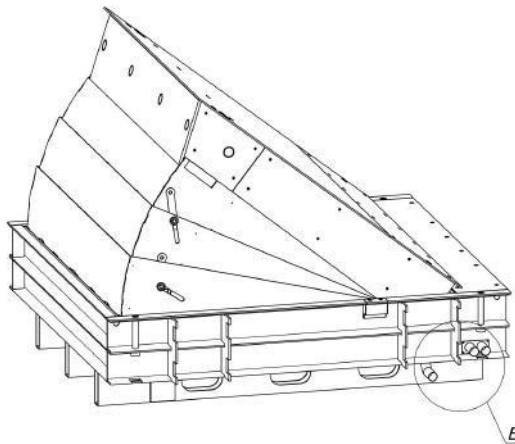
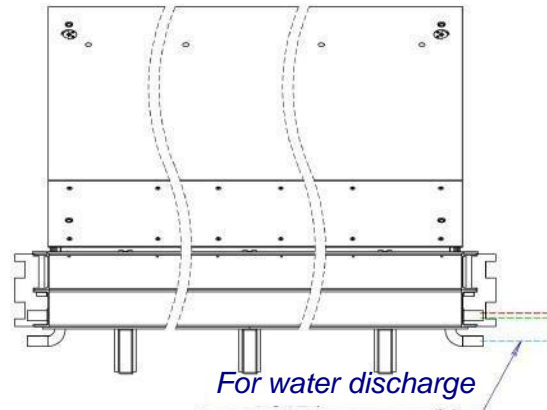
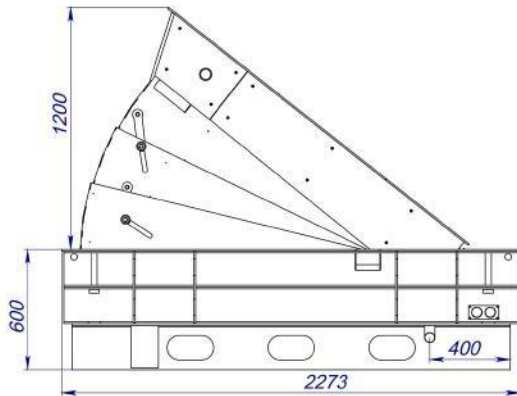
ROAD BLOCKING SYSTEMS



Antirammung Road Blocker

7. Connection of Road Blocker Utilities

7.1 Water discharge diagram



ROAD BLOCKING SYSTEMS



Antirammung Road Blocker



- Make sure of the road blocker installation accuracy and attachment security prior to its connection.
- Take a close look at the hydraulic system and power supply connection diagrams as well as hydraulic unit and electronic control unit operation instructions.

7.2 Road Blocker connection to control unit

Control unit is assembled in case (box) and is located in cabinet of peripheral hydraulic unit. Accordingly control cable, protective earthing cable and two hydraulic hoses are connected from the peripheral hydraulic unit cabinet to the Road Blocker. Control cable and earthing between Road Blocker and control unit is put in plastic or corrugated pipe.

1. High pressure hoses to be connected to hydraulic unit according to connection diagram.
2. Road Blocker to be connected control unit with control cable and earthing cable.
3. 50 cm cable length margin from each side to be left to ensure remedial maintenance. Cable length margin to be folded inwards utility conduit.
4. The Road Blocker wiring and operation is performed according to OPERATION MANUAL. PART II. "Wiring of Road Blockers (RB series)", section 1.6. "Connection of the Road Blockers with capacity of 1,6 – 11 kW with peripheral 1-phase or 3-phase hydraulic unit and putting them into operation", "Annex 5" and "Annex 6".

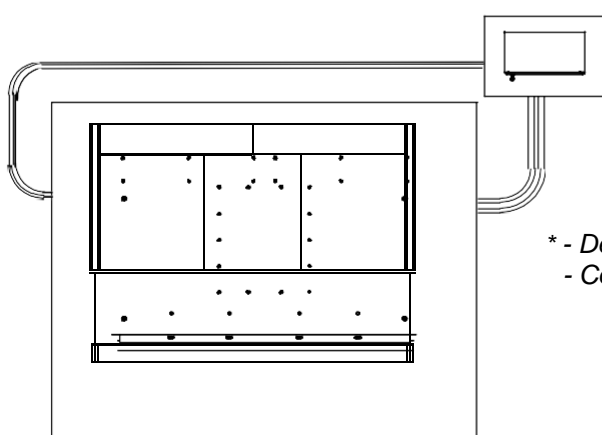


- The road blocker utilities must be connected when it is deenergized!
- The relevant instructions should be strictly followed during connection!
- The road blocker utilities must be connected only by the properly qualified professionals!



It is advised to lay electrical cables in corrugated polyamide tube with waterproof sealed connectors to protect them against mechanical damage and environmental harmful impact.

Designed position*



Control unit.
Designed position*

- * - Designed position is specified by individual design solutions.
- Control unit can be located within 25m from road blocker.

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8. Precommissioning

8.1 Preparation for precommissioning:

- Compliance and reliability of the road blocker, hydraulic unit and control unit electrical cable connections to be checked;
- The roadbed around road blocker to be restored;
- The equipment power network to be checked;
- Reliability of connection with earth loop to be checked.

8.2 Precommissioning:

- Hydraulic unit and control unit to be energized;
- Road blocker trial operation to be conducted;

The following shall be checked while conducting trial operation:

1. Hydraulic unit operation parameters;
 2. Control unit and remote control panel operation parameters;
 3. Road blocker operation parameters.
- The required equipment performance parameter setting to be set, if appropriate.
 - Oil to be refilled after hydraulic unit is actuated and air is removed from hydraulic cylinders;
 - If a fault is detected it is necessary to trace the trouble and remedy it, if applicable*.
(* - See Table 1).



- Commissioning, equipment adjustment, troubleshooting shall be performed only by the properly qualified professionals!
- Safety regulations should be strictly observed during commissioning and equipment adjustment!



- It is forbidden:
 1. to prevent raising/sinking of road blocker platform;
 2. to touch the road blocker's moving parts during its operation;
 3. to initiate movement of vehicles prior to complete sinking of the road blocker's barrage elements.

The area adjacent to road blocker shall be free and clear of foreign items.

ROAD BLOCKING SYSTEMS

Antirramming Road Blocker

Table 1. Road Blocker Fault Finding

Symptom	Possible cause	Remedy	Notes
Barrage platform is raising by fits and starts	<ol style="list-style-type: none"> 1. There are foreign particles in guiding grooves. 2. Shaft seizure. 3. Cylinder is jammed. 	<ol style="list-style-type: none"> 1. Guides to be cleaned and shafts to be lubricated. 2. Cylinder condition to be checked and replaced, if appropriate. 	
Incomplete raising and sinking of platform	There are foreign particles in guiding grooves.	Guides to be checked and cleaned. Shafts to be lubricated.	
Actuation of hydraulic unit is far too often	<ol style="list-style-type: none"> 1. Oil leakage. 2. Air inleakage. 	<ol style="list-style-type: none"> 1. Hydraulic connections to be checked. 2. Air to be evacuated from hydraulic system. 	
Operation noise	<ol style="list-style-type: none"> 1. High-viscosity hydrolic fluid. 2. Pump is worn out. 3. Air inleakage. 	<ol style="list-style-type: none"> 1. Oil to be changed. 2. Pump to be replaced. 3. Air to be evacuated from hydraulic system 	
Excessive heating of hydrolic fluid	<ol style="list-style-type: none"> 1. Contamination of hydraulic system. 2. Continuous operation. 	<ol style="list-style-type: none"> 1. Hydraulic system to be cleaned. 2. Operation conditions to be observed according to the datasheet. 	
Incomplete raising of platform	<ol style="list-style-type: none"> 1. Oil low level 	<ol style="list-style-type: none"> 1. Oil level to be checked and filled up to the required level 	

9.

Road Blocker Operation Regulations

9.1 To ensure the road blocker continuous and reliable operation it is necessary:

- to use the road blocker according to its intended purpose;
- all rules specified in this Manual shall be strictly observed during operation;
- to provide maintenance and repair of equipment in due time;
- to prevent the road blocker operation and maintenance to be performed by unauthorized persons;

9.2 Equipment Maintenance:

9.2.1 The road blocker maintenance includes preventive measures to be taken according to the established frequency to maintain the road blocker in operational condition, decrease component wearing and prevent faults and malfunctions.

Antirammung Road Blocker



Equipment examination and maintenance shall be performed according to Schedule* and only by properly qualified professionals.

* See Table 2.

9.2.2 Recommended types of the road blocker maintenance (M):

- Daily inspection (each shift);
- M-1 (monthly);
- M-2 (semiannually);
- M-3 (annually);
- Major repair (MR) – after 20000 cycles.

Table 2. Road Blocker maintenance schedule

M type	Frequency	Scope of control/work
Daily inspection	each shift	<p>Normally the daily maintenance is performed before commencement of work and includes visual inspection of the road blocker and, if required, prompt mechanical troubleshooting, elimination of corrosion and surface pollution.</p> <p>The following control shall be conducted during daily maintenance:</p> <ul style="list-style-type: none"> • availability of all units and sensors in their proper locations and their fastening security; • performance of all sensors and cable integrity; • road blocker normal operation without jerks and abnormal noises, jamming of movable constructional elements; • motor heating (over 70°C).
M-1	monthly	<p>M-1 is performed monthly and includes the following measures:</p> <ul style="list-style-type: none"> • measures in the scope of daily inspection; • elimination of dust from the road blocker housing and components; • cleaning of actuators, sensors and drive; • verification of sensors fixation reliability and their performance; • verification of good condition and fastening security of cable connections to actuators, sensors; • check of availability and integrity of protective fences and devices.
M-2	semiannually	<p>M-2 maintenance is performed semiannually including the following types of work:</p> <ul style="list-style-type: none"> • measures in the scope of M-1; • verification of fastening security of units and devices.
M-3	annually	<p>M-3 maintenance is performed annually including the following types of work:</p> <ul style="list-style-type: none"> • measures in the scope of M-2; • check of status of bearings, sealing cups and lubrication; • blowing and cleaning of terminal boxes; • tensioning of screw joints of terminal boxes; • check of reliability and quality of cable connections and earthing; • check of insulation resistance; • repair of paint coatings.

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The hydraulic unit maintenance shall be performed according to the guidelines specified in the hydraulic unit instruction manuals, combining them with M-2 or M-3.

Major repair is recommended to be performed by the manufacturer or dedicated repair service according to the manufacturer's documentation with the use of the manufacturer's spare parts as well as restored or manufactured by special repair facilities according to the manufacturer's documentation.

Mean lifetime between major repair is at least 20000 hours.

- The time of maintenance and major repair can be increased or decreased depending on actual parameters of the road blocker operation and fixed by the company operating this equipment.
- All types of maintenance should be recorded in maintenance and repair work sheet.

9.3 Safety regulations:

The appropriate safety measures shall be observed during operation and maintenance of the road blocker.



9.3.1 IT IS FORBIDDEN TO USE DEFECTIVE APPLIANCES, TOOLS, INSTRUMENTATION THE SERVICE LIFE OF WHICH EXPIRED.

9.3.2 Installation and operation of electrical equipment should be performed at the factory according to the Regulations for Operation of Consumer Electrical Installations, Safety Rules for Operation of Customers' Electrical Installations complied with the Occupational Safety Standards System.

9.3.3 The road blocker must be repaired by the persons being over 18, having at least level III of electrical safety qualification, relevant permit to work with electrical facilities up to 1000V, be safety briefed at workplace and scrutinized the product instruction manuals.

9.3.4 It shall be the responsibility of the owner to ensure safety measures.

9.3.5 Hazardous characteristics during the road blocker operation are:

- mechanical impact of raising/sinking dynamic part;
- electric shock by 220V/380V.

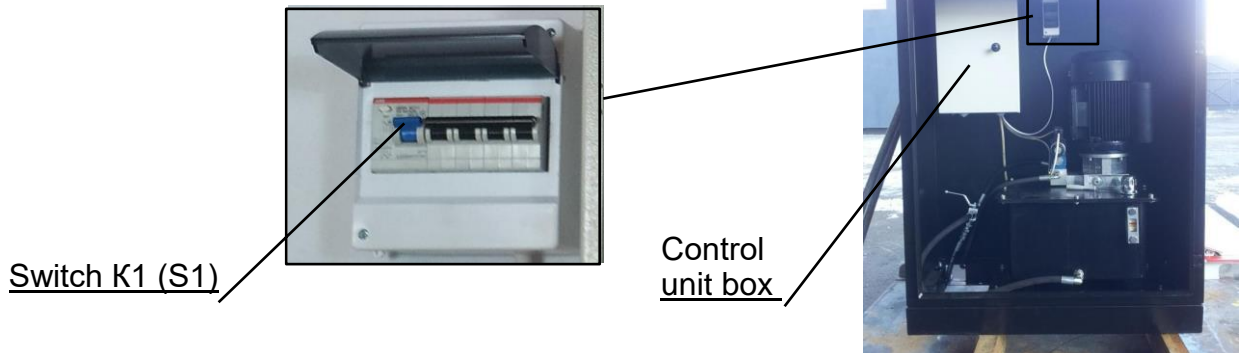
ROAD BLOCKING SYSTEMS



Antirammung Road Blocker

9.3.6 Service and repair shall be performed only when equipment is deenergized, a forbidding safety sign according with notation "DO NOT SWITCH ON MEN WORKING!" is put on initiator. After completion of works safety signs should be removed and equipment should be actuated only upon authorization of the work superintendent.

The road block is deenergized by switch K1 (S1) in the control unit box.



9.3.7 The road blocker electrical equipment should be earthed. Resistance between earthing bus and each accessible metal non-current-carrying part of the road blocker electrical equipment housing should not exceed 4 Ohm.



9.3.8 It is forbidden:

- to perform maintenance and repair works when the road blocker electrical equipment is energized;
- to perform maintenance and repair works when equipment is in operation.

9.3.8 General safety requirements accepted in the particular company should be in effect during installation and operation of the road blocker.

9.3.9 Fire safety regulations should be observed when paraffin oil for rinsing of units and parts is used.

9.3.10 The safety instructions specified in instruction manuals for purchased products and control system should be additionally governed by.

9.3.11 The road blocker operating in conjunction with other technological equipment should have common locking with it.

Antirammung Road Blocker



It is strictly forbidden:

- *to allow the persons being unfamiliar with operation and safety rules to service the road blocker;*
- *to operate the road blocker unearthed;*
- *to touch current carrying elements;*
- *to touch movable parts of the road blocker during operation;*
- *to operate the road blocker when protective devices and switches are removed;*
- *to prevent the road blocker raising and sinking;*
- *to use metalwork of the road blocker for connection of neutral wire of electric welder;*
- *to perform welding works near the road blocker without noncombustible material protection to avoid its burning.*

Important!



- *Prior to operation of the road blocker make sure that all units providing safety of works are in good condition and properly installed;*
- *Take into account that the Tyre Killer could be damaged during transportation;*
- *Don't disconnect the elements providing safety of works and don't try to modify them;*
- *In case of any faults or defects, inform the person in charge of the product service.*

10. Warranty Liabilities

- *The warranty period is 1 year.*
- *The warranty period is effective from the date of road blocker sale.*
- *The warranty is valid only subject to compliance with operation regulations and safety measures.*
- *The warranty repair shall not be performed in the following cases:*
 - *expiration of the warranty period;*
 - *improper operation;*
 - *the product bears the traces of tampering or attempt of unauthorized repair;*
 - *damage resulted from the use of inappropriate accessories;*
 - *damage caused by environment;*
 - *damage resulted from the use of nonstandard or incompatible equipment;*
 - *damage caused by exceeding of maximum permissible loads.*

In all cases, when the product is not subject to warranty repair, a paid repair may be considered.

Warranty repair shall be performed upon availability:

- *Product datasheet;*
- *Warranty coupon with stamped date of sale.*

Antirramming Road Blocker

11. Road Blocker Hydraulic System

11.1 The road blocker hydraulic actuation is provided by hydraulic unit.

Hydraulic Unit Basic Technical Features

for class K4 Road Blocker K4 (M30)	L=1000 AUIA-311	L=2000 AUIA-312	L=3000 AUIA-313	L=4000 AUIA-314
Maximum pump capacity, l/min	10	18	37	28
Operating pressure, MPa	7	7	5	8
Motor				
Pump				
Shaft speed, rpm	2750	2750	2750	2750
Alternate current, V	380	380	380	380
Motor capacity, kW	1,5	3	4	5,5

for class K8 Road Blocker (M40)	L=1000 AUIA-321	L=2000 AUIA-322	L=3000 AUIA-323	L=4000 AUIA-324
Maximum pump capacity, l/min	10	18	37	28
Operating pressure, MPa	8	8	6	8
Motor				
Pump				
Shaft speed, rpm	2750	2750	2750	2750
Alternate current, V	380	380	380	380
Motor capacity, kW	2	3	5	6

for class K12 Road Blocker (M50)	L=1000 AUIA-331	L=2000 AUIA-332	L=3000 AUIA-333	L=4000 AUIA-334
Maximum pump capacity, l/min	10	18	37	37
Operating pressure, MPa	9	9	7	8
Motor				
Pump				
Shaft speed, rpm	2750	2750	2750	2750
Alternate current, V	380	380	380	380
Motor capacity, kW	2,2	4	6	7,5

ROAD BLOCKING SYSTEMS



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11.2 Hydraulic unit fluid:
Recommended hydraulic fluid - Shell TELLUS S 46.

11.3 Hydraulic Unit:



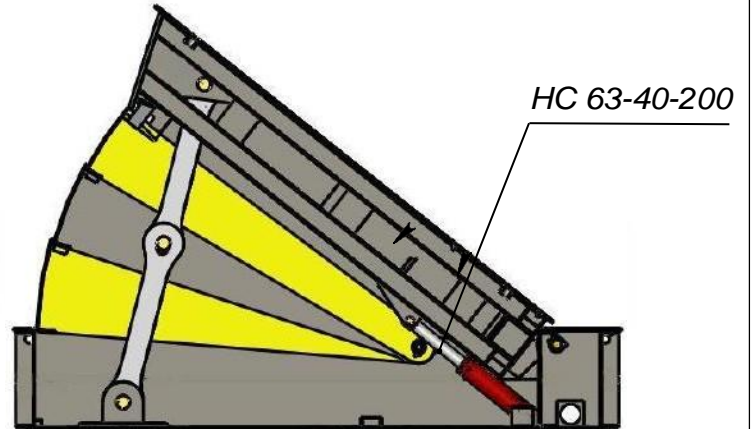
7,5 kW



2,2 kW

Hydraulic cylinders:

HC 63-40-200
(Piston diameter 63 mm,
Rod diameter 40mm,
Stroke 200 mm)



1SNDN12 high pressure hoses are used for connection of the road blocker hydraulic cylinders to oil pumping station.



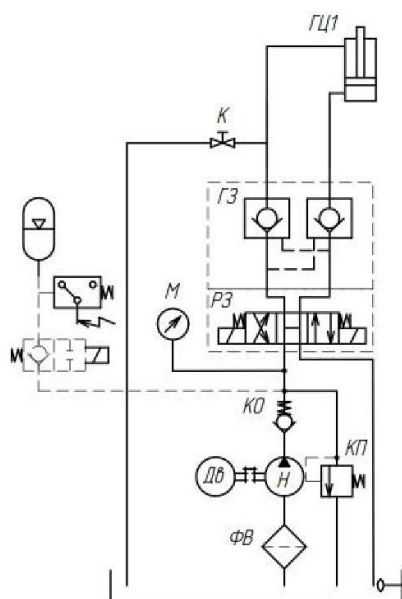
Code	NW	Internal ϕ (mm)	Reinforced ϕ (mm)	External ϕ (mm)	Operation pressure (bar)	Min. burst pressure (bar)	Min. bending radius (m)	Weight (kg/m)
1SNDN12	12	12,7	18,3	21	215	640	180	0,41

ROAD BLOCKING SYSTEMS

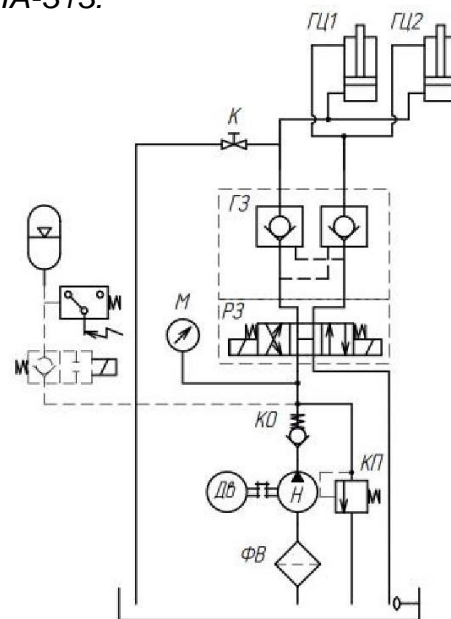


Antirramming Road Blocker

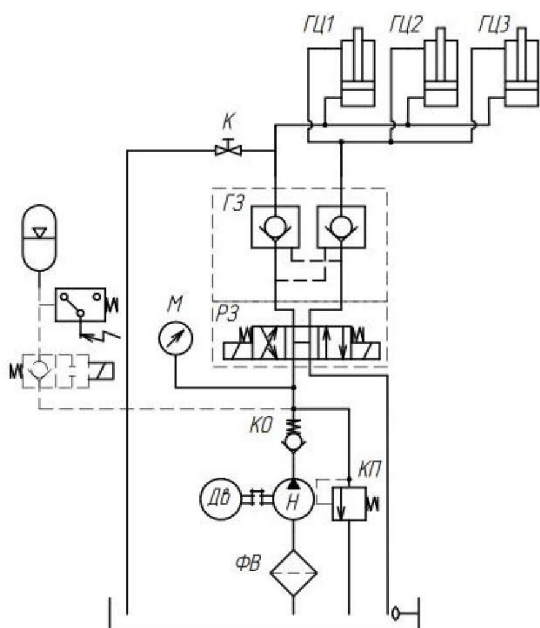
11.4.1 Hydraulic Diagram for:
AUIA-311, AUIA-321, AUIA-331:



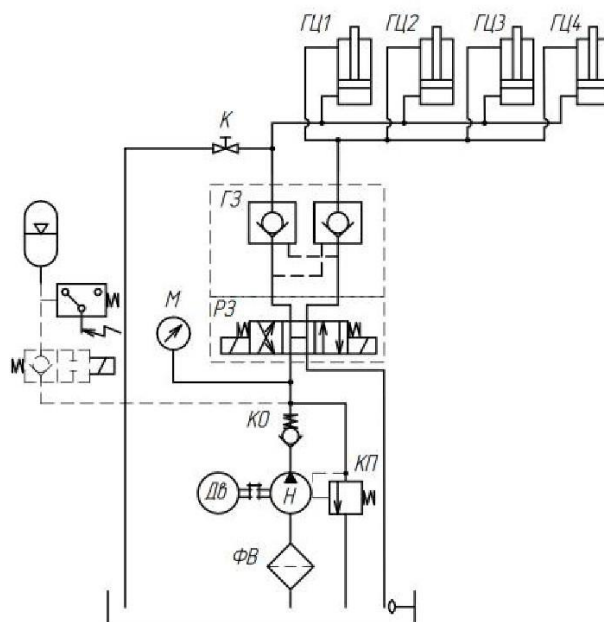
11.4.2 Hydraulic Diagram for:
AUIA-312, AUIA-322, AUIA-332,
AUIA-313:



11.4.3 Hydraulic Diagram for:
AUIA-314, AUIA-333, AUIA-xxx:
AUIA-xxx,



11.4.4 Hydraulic Diagram for:
AUIA-334, AUIA-324:



Legend:

M - Motor;
H - Pump;
ГЗ - Hydraulic lock;
P3 - Distributor;

КП - Safety valve;
КО - Inverted valve;
ФВ - Filter;
ГЦ1-ГЦ4 - Hydraulic cylinders.

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13.

Note

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