

Automatic barriers

## **AG/500, AG/900, AG/M1**

Manual



Manufacturer:

**AUTOGARD spol. s r.o.**  
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### Acknowledgement

Thank you for choosing our automatic barrier. All Autogard products are placed on the market after test installations in hardest conditions.

All the materials and components used are top quality and are exposed to many tests throughout the production process.

Autogard products have been designed for high performance, easy maintenance and durability.

The production follows generally accepted technical standards and regulations.

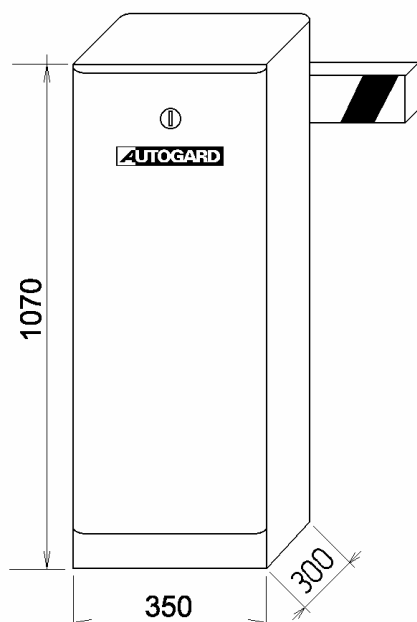
### Basic description

Automatic barriers AG/500, AG/900, AG/M1 are driven by electric motor with a high torque and V-belt driven enough sized worm gearbox. These barriers are designed for continuous operation. Autogard barriers are controlled by a microprocessor control unit AGN3.x. Casing is made of 2,5mm (AG500) or 3mm (AG900) thick steel sheet, hot dip galvanized and powder coated.

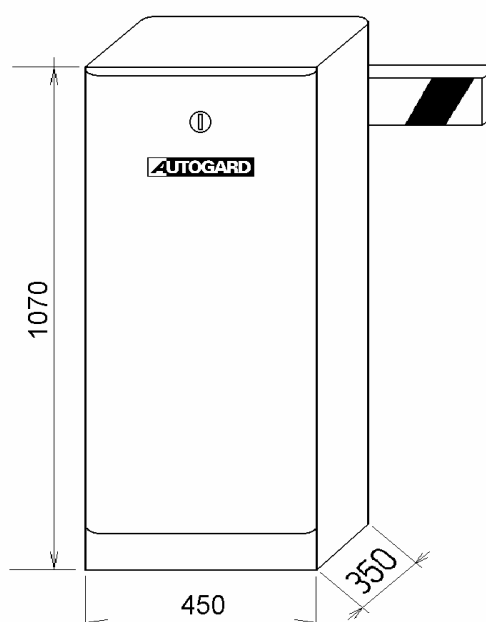
### Technical datas

Type	AG/500	AG/900	AG/M1
Motor	230V AC 370W	230V AC 250W	230V AC 550W
Boom length	3 - 5 m	6 - 9 m	1 - 3 m
Operation speed	3 s	5 s	1 s
Dimensions	350 x 300 x 1070	450 x 350 x 1070	350 x 300 x 1070
Weight	95 kg	130 kg	95 kg
Control unit	AGN 3.x	AGN 3.x	AGN 3.x
Closing	Automatic	Automatic	Automatic
IP code	min IP 43	min IP 43	min IP 43

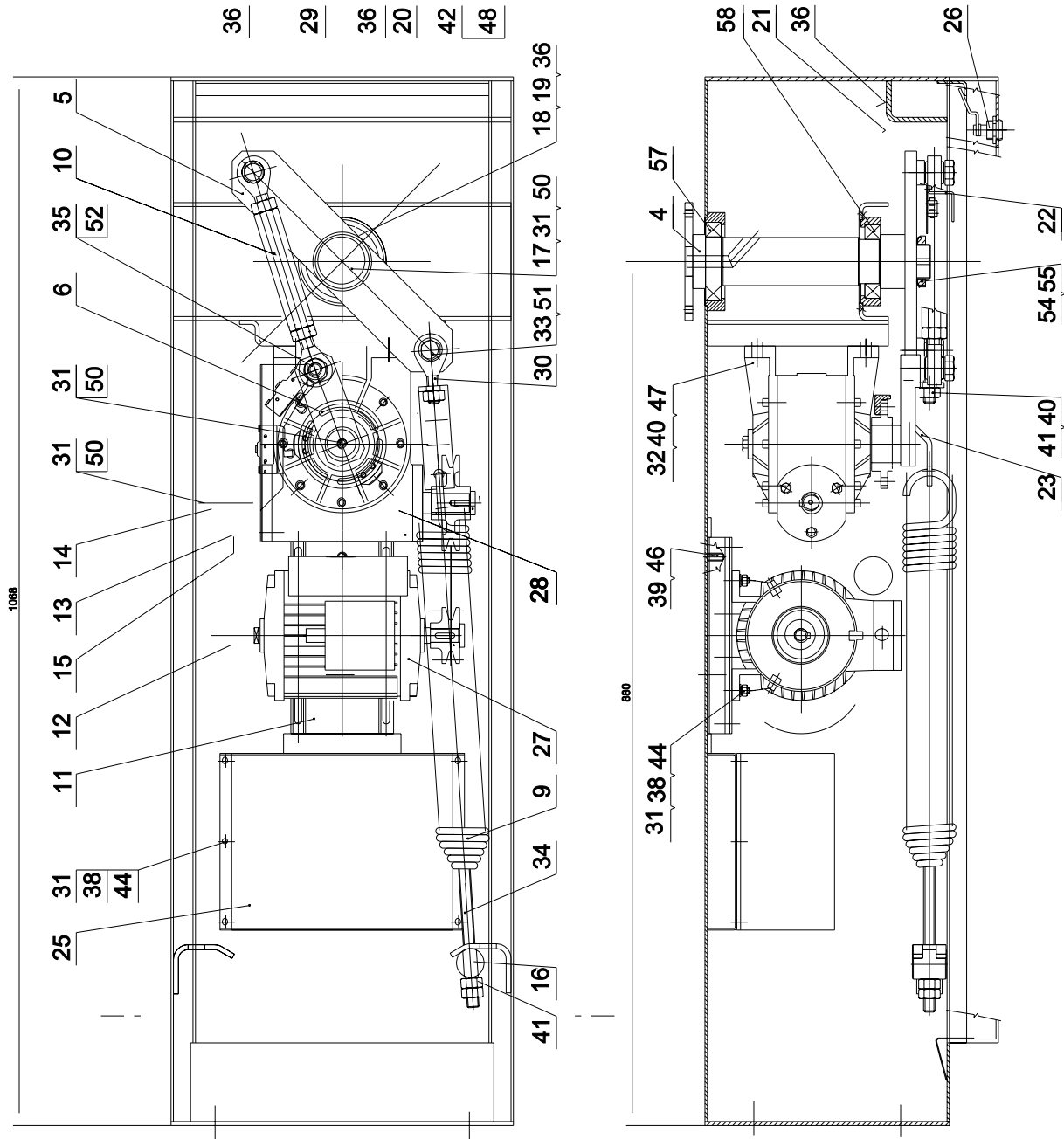
AG/500:



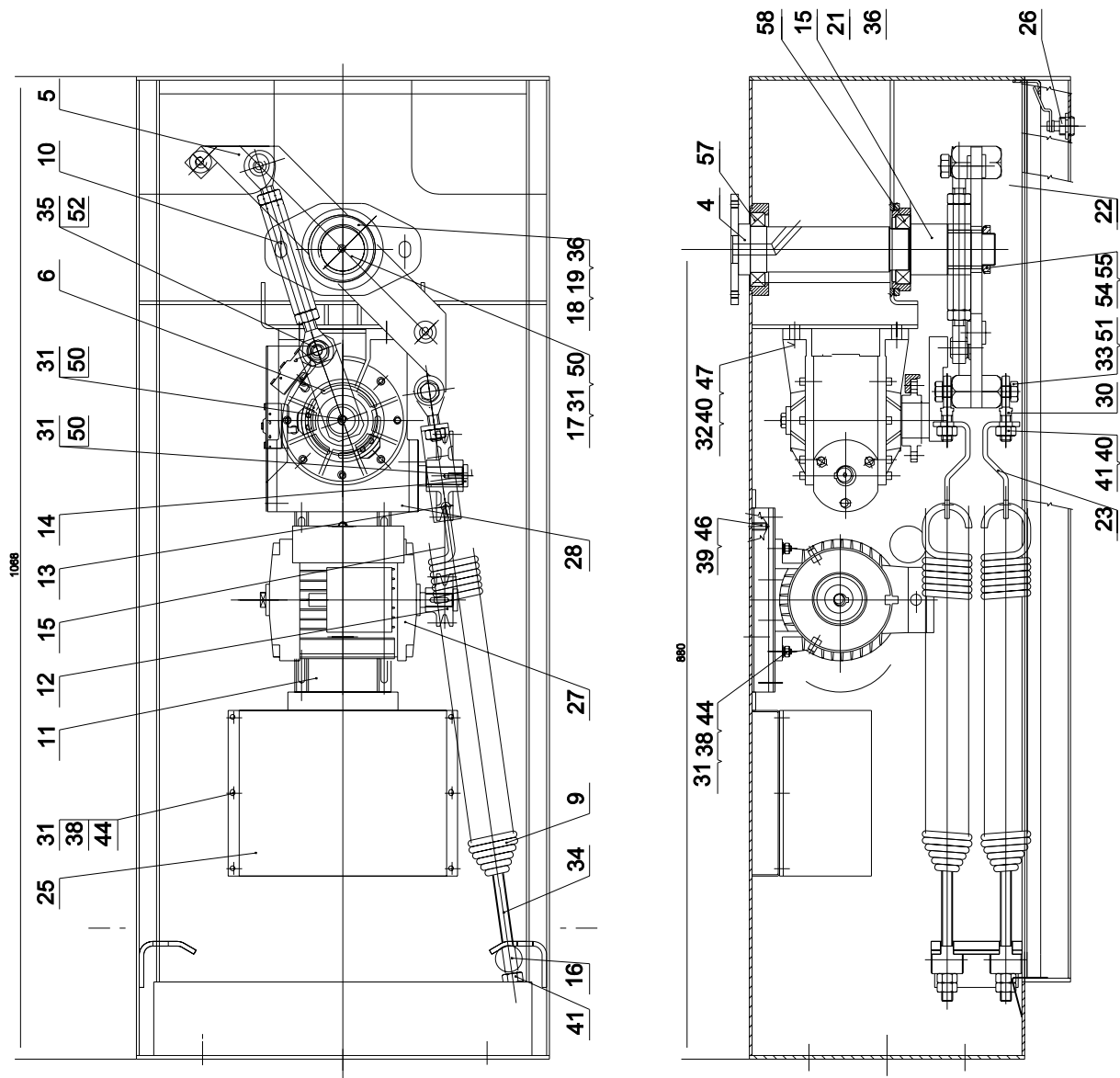
AG/900:



### Detailed scheme of AG/500



### Detailed scheme of AG/900



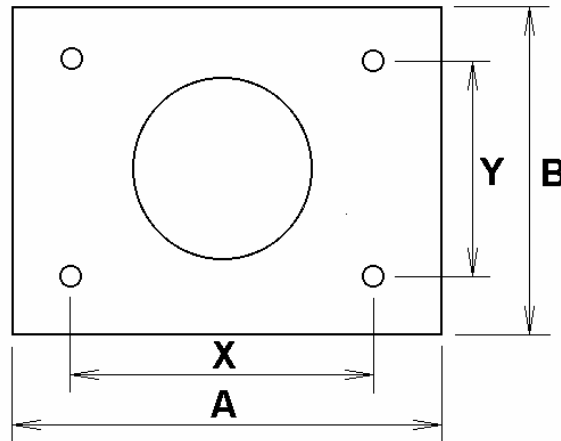
### Construction site preparation

#### **! LEAVE 20cm FREE SPACE AROUND THE FOUNDATION PLATE !**

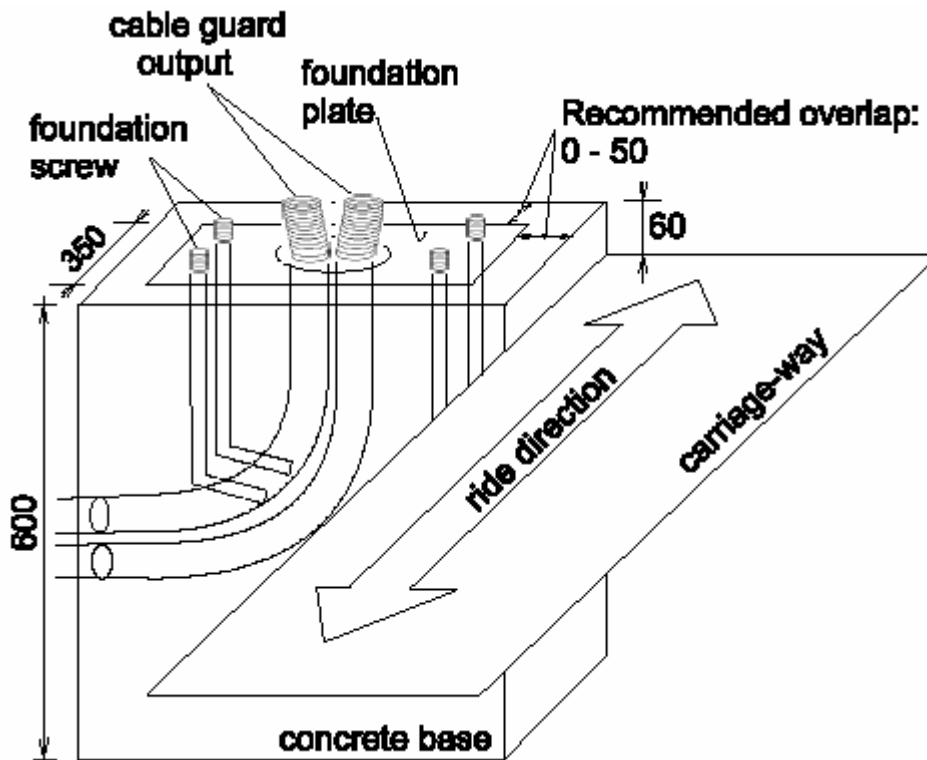
The barrier is fixed to firmly attached (embedded in concrete, welded) foundation kit which consists of foundation plate and 4 M12 screws with nuts. Dig the foundation at least 600 mm deep, all cable connections (220V AC, earthing cable..) are to be properly protected (see picture).

Foundation plate:

[mm]	AG/500	AG/900
X	260	310
Y	150	170
A	350	450
B	310	350



Barrier foundation:



## Embedding the barrier and boom fixing

Barrier is placed on properly cleaned foundation plate with its door open so we can check the right positioning on M12 foundation screws and extension of cables through the central bottom hole. Fix washers and nuts M12 to the foundation screws and tighten them. After tightening the nuts the barrier may not move in any direction, because power up to 5kN acts when the boom is moving.

The boom is fixed by means of supplied holder to the booms axis of rotation.

The rod length limits preset 90° boom movement. If required it is possible to slightly adjust the range of movement.

### Power supply connection

#### **MAY BE CONDUCTED BY AUTHORIZED PERSON ONLY**

After the barrier is fixed carry out input cable 230V AC (usually CYKY 3x1,5) connection. Connect the conductors to relevant clamps of control unit and also connect the barrier earthing cable to the earthing screw of barrier.

### Arm lengths, pulleys and springs

It is necessary to use correct balancing springs and pulleys for each length and type of boom (see the table below):

Aluminium profile booms:

Barrier type	Boom length [m]	Spring type		Pulley length [mm]/ V - belt
		Boom no accessories	Boom with accessories	
AG/M1	3	O	Z	75/Z10x475
AG/500	3	O	Z	75/Z10x450
	4	Z	M	100/Z10x475
	5	M	W	112,5//Z10x500
AG/900	6	Z + Z	Z + M	150/Z10x580

Aluminium round booms:

Barrier type	Boom length [m]	Spring type		Pulley length [mm]/ V - belt
		Boom no accessories	Boom with accessories	
AG/M1	3	O	Z	75/Z10x475
AG/500	3	O	Z	75/Z10x450
	4	Z	M	100/Z10x475
	5	M	W	112,5/Z10x500
AG/900	6	M	W	100/Z10x475
	7	Z + Z	Z + M	112,5/Z10x500
	8	Z + M	M + M	150/Z10x580
	9	M + M	M + W	150/Z10x580

Springs:

Z – green spring

O – orange spring

M – blue spring

W – white spring

## Boom balancing

After the boom is fixed to the barrier it is necessary to check its balancing by means of spring. The barrier is assembled for certain length of boom (speed, balancing). In case boom of different length is mounted it is necessary to do following:

The balancing is done for desired boom + all possible accessories, also spring has to be mounted, the rod between gear box and boom axis lever has to be disjoined.

The balancing is done by means of stretching or loosing the spring with bolt on the bottom end of spring. The balanced system has fluent run during the whole cycle. After balancing is finished, connect the boom by means of rod to the gear box and secure it with nuts.

This operation has cardinal importance in light of fluent boom run and minimum stress to the mechanical components of barrier.

Notice: It is necessary to carry out the balancing after any replacement of boom by different one or after mounting or dismounting boom accessories.

## Limit switches setting

Limit switches control boom movement and switch off the motor in booms terminal positions. End switches are placed on the brace of gear box. Switches are fixed with M5 imbus type screws to their holder on output axis of gear box.

The goal is to ensure 90° boom movement range, the boom reaches its limit positions with virtually zero angular velocity and no mechanical end stops are required.

## Emergency barrier opening

Situation may turn up during the barriers life-time when it's necessary to open or close it manually (for example power supply failure).



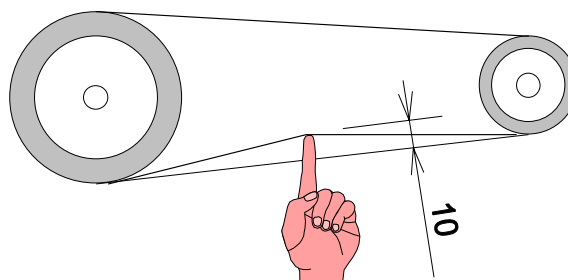
**! Emergency opening or closing may be carried out with power supply switched off only !**

In this case it is necessary to use provided unblock crankle which is put on the opposite side of electromotors shaft than the belt pulley (on the same side in case of AGM1 barrier). Facets to insert the unblock crankle are made here. Rotating shaft the boom moves upwards or downwards depending on the rotation direction.

## Maintenance

Automatic barrier is designed and manufactured as a maintenance-free product. For long-lasting and trouble-free functioning we recommend to carry out following operations every three months:

- 1) Check the ground wire connection, tighten the nut if necessary
- 2) Check visually all screwed joints, tighten them if necessary
- 3) Oil all the joints
- 4) Check tightness of the V-belt, its ideal move is 10 mm (see the picture), tighten or loosen it if necessary

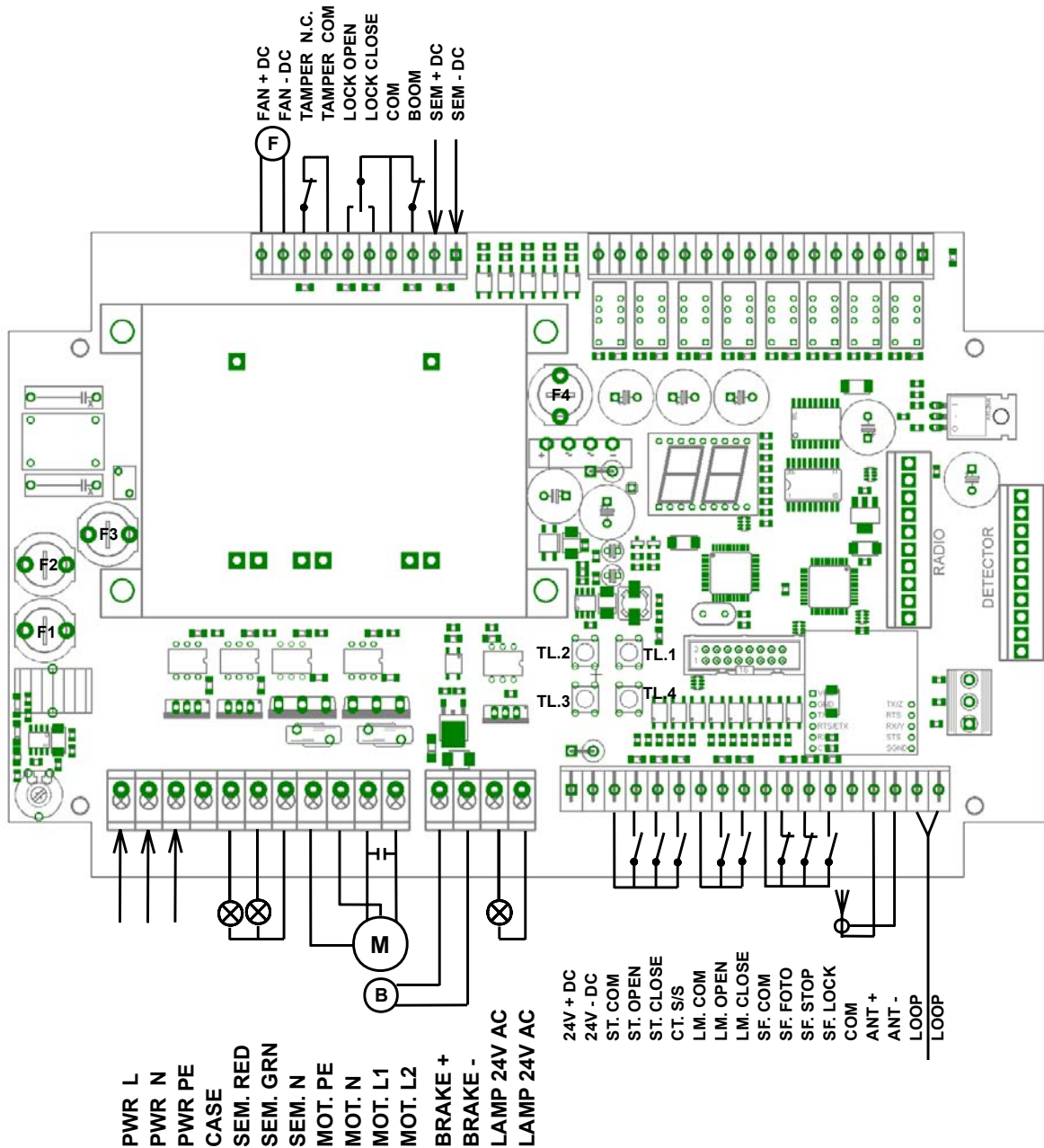


## Control unit and its connection

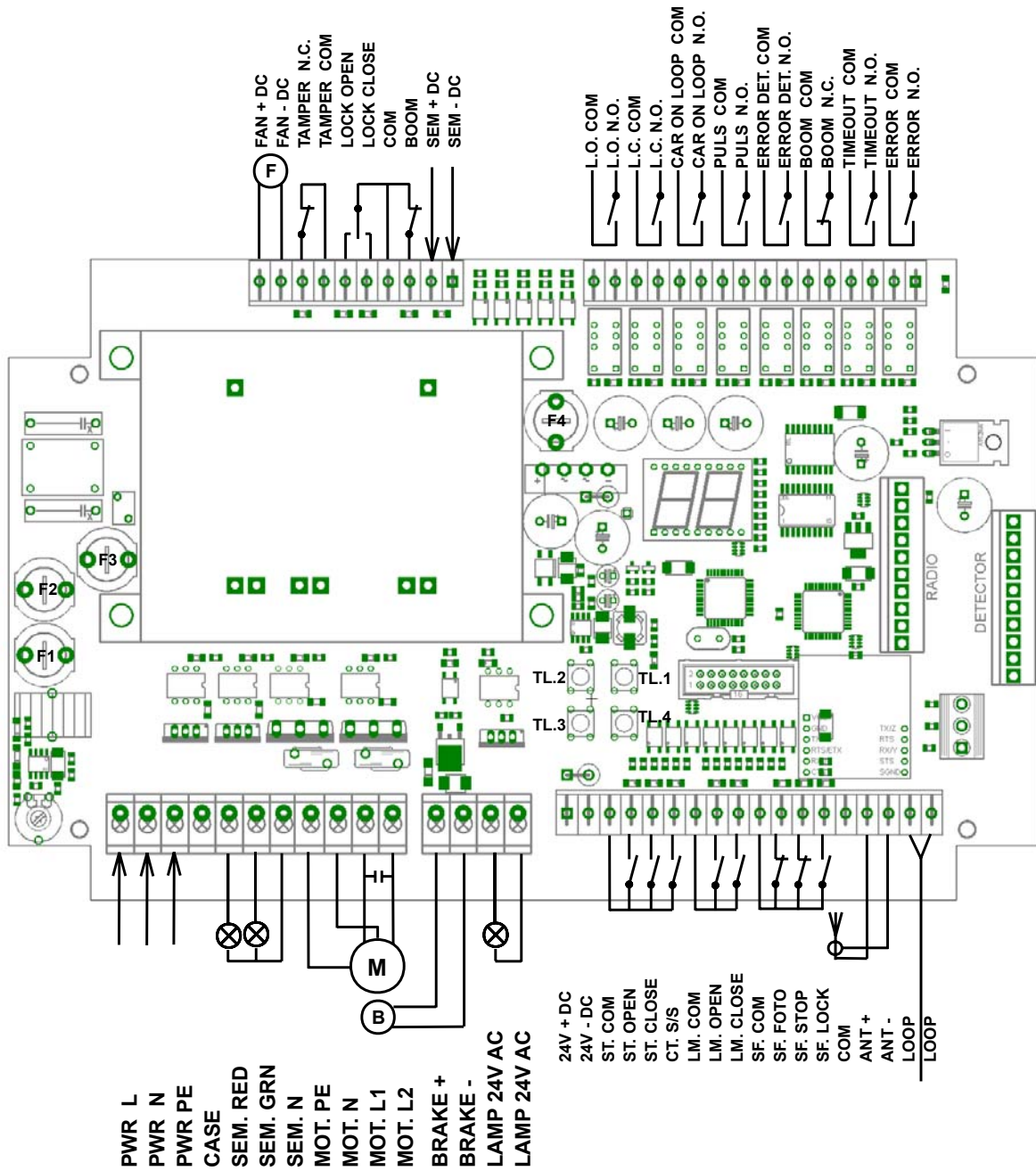
Barriers AG/500, AG/900 a AG/M1 are supplied with control unit:

**Control unit AGN3.0/3.1** – microprocessor based control unit, loop detector and radio receiver modules may be plugged in.

Control unit AGN 3.0 scheme



Control unit AGN 3.1 scheme



Current cutout review:

Current cutout	Type	Value
F1	T	
F2	T	
F3	F	
F4	T	

**Control unit AGN 3.0/3.1 clamp connections:****Lower part of unit – power and control inputs**

Clamp	Part	Signal
L	POWER	230V AC connection - phase
N		230V AC connection – inner conductor
PE		230V AC connection – protective conductor
CASE	CASE	Cabinet earth wire
RED	SEMAPHORE	Semaphore clamps – signalling STOP phase
GRN		Semaphore clamps – signalling GO phase
N		Semaphore clamps - inner conductor common
PE	MOTOR	Motor – protective conductor PE
N		Motor - inner conductor
L1		Motor – direction open phase
L2		Motor – direction close phase
+	BRAKE	Motor brake 24V +
-		Motor brake 24V -
+	LAMP	Flashlight or lighting 24V AC output
-		Flashlight or lighting 24V AC output
+	24V	Accessories 24V DC power supply output
GND		Maximum 300 mA
COM	START	Control inputs common clamp
PEN		Control button open (NO) input
CLOSE		Control button close (NO) input
S/S		Control button „ step-by-step “ (NO) input
COM	LIMIT	Control inputs common clamp
OPEN		Limit switch upper position NC contact input
CLOSE		Limit switch lower position NC contact input
COM	SAFE	Control inputs common clamp
FOTO		Security contact FOTO input (blocks closing) (NC)
STOP		Security contact STOP button input (blocks any movement) (NC)
LOCK		Contact LOCK (NO) input, barrier remains permanently open for the duration of this signal
COM		Control inputs common clamp
ANT +	ANT	Aerial centre input for plug-in remote control receiver
ANT GND		Aerial screening input for plug-in remote control receiver
LOOP	DET	Inductive loop connection clamps

**Upper part of unit – Left part – control signals**

Clamp	Part	Signal
FAN		Fan connection 24V DC ( for AGM1)
TAMPER-COMM		Door security contact connection clamps ( NC )
LOCK OPEN		LOCK ( NO ) contact input , barrier remains permanently open for the duration of this signal, ignores other commands
LOCK CLOSE		LOCK ( NO ) contact input, barrier remains permanently closed for the duration of this signal, ignores other commands
COMM		Security inputs common clamp
BOOM		Arm damage detection contact input ( NC )
SEM +		Semaphore remote control input +24V
SEM-		Semaphore remote control input -24V

**Upper part of unit – Right part – Informative signals (1 output maximum load 24V/0,3A)(only for AGN 3.1)**

Clamp	Part	Signal
LIMIT OPEN		Barrier open
LIMIT CLOSE		Barrier closed
CAR ON LOOP		Car on loop (when LOCK activated – switched off)
PULS		Barrier open and car on the loop impulse (0,5s) (when LOCK activated – switched off)
ERROR DET.		Detector malfunction (only for PLD)
BOOM		Arm damage detection open input
TIMEOUT		Motor work time elapsed (barrier hasn't finished its movement)
ERROR		Control unit malfunction

**Plug-in modules use:**

Connector	Module
MODULE RADIO	Plug-in radio receiver – barrier control according to programmable parameters. For Rxd2pp receiver. The PLD detector can be used also in this connector (the loop is connected instead of aerial) and has opening/closing function – when car stands above the loop the barrier either opens or closes – according to programmable parameter <b>02</b> or <b>03</b>
MODULE DETECTOR	Plug-in inductive detector – barrier closing + security function For PLD detectors – function according to programmable parameter <b>01</b>

**a) Control unit start:**

After the control unit is powered up green LED in upper right corner starts to shine and in the row of LEDs next to the plug-in connector the LEDs according to inputs activated start to shine also.

After that the system comes in its base state – dashes are flashing on the display – this means the barrier will work normally.

**b) Base state:**

Barrier in rest. In case the boom is in closed position the control unit awaits command OPEN. This may come in few ways. With the button TL3, input on the „open“ clamp, opening detector or with remote control. When the boom is moving upwards and there is a demand for downwards move the barrier finishes the upward move and starts to close in case some of the security inputs isn't activated or when step-by-step mode is used. When moving downwards inputs FOTO and DET are tested. In case these inputs are activated the boom stops its move and starts to move upwards or with any OPEN command. STOP input stops the boom and blocks any movement.

**c) Control unit settings change:**

In the control units base state (dashes are flashing) simultaneously push both programming buttons (TL1, TL2) to enter the programming mode. The number of selected function is displayed. This number can be changed using the programming buttons TL1 and TL2. Select the number of function you wish to change. Press buttons TL1 and TL2 simultaneously – you enter the settable parameters of this function (blinking values on the display). These values can be changed using the programming buttons TL1 and TL2 according to the table of programmable functions. Store the requested parameter by pushing buttons TL1 and TL2 simultaneously, control unit returns to its base state (dashes are blinking on the display). To change other parameters proceed in the same way.

**Programmable functions table:**

<b>Function number</b>	<b>Function description</b>	<b>Values range</b>	<b>Preset</b>
01	<b>DETECTOR – plug-in detector PLD function setting</b> 00 - Detector not used 01 - Detector has security function only (blocks closing) 02 - Detector has security + closing function (automatically closes after car passes) set parameter <b>05</b> to value <b>01</b>	00 - 02	01
02	<b>RADIO1 – plug-in receiver Rxd2pp relay A function setting</b> 00 - Relay A opens the barrier or inductive detector PLD is used as opening (after car enters the loop barrier opens automatically, inductive loop connected to input ANT) 01 - Relay A „step-by-step“ 02 – Not implemented (do not programme)	00 - 02	00
03	<b>RADIO2 – plug-in receiver Rxd2pp relay B function setting</b> 00 - Relay B switched off 01 - Relay B closes barrier	00 - 01	00
04	<b>LAMP – flash light or boom warning lighting function setting</b> 00 - Warning lights blink during movement only 01 – Warning lights blink permanently	00 - 01	00
05	<b>FOTO – closing impulse memory while FOTO input interrupted</b> 00 – While FOTO input interrupted control unit ignores close command 01 – While FOTO input interrupted control unit remembers closing impulse, when FOTO input connected again command is carried out	00 - 01	01
06	<b>TIMER – setting time of automatic barrier closing after opening</b> 00 – Automatic closing switched off 01 – 99 - Automatic closing activated, number set corresponds to time in seconds	00 - 99	00
07	<b>DELAY – delay of closing after close command</b> (flash light pre-flashing) 00 – Delay switched off 01 – 99 – Set time of delay in seconds	00 - 99	00
08	<b>Semaphore switch to STOP signalling time setting</b> 00 – Semaphore switches with close command 01 – Semaphore switches with activation of some security input (it means when car enters the area close to the barrier) 02 - Semaphore is controlled externally by powering up (24V DC) the SEM input	00 - 02	00
09	<b>Setting of barrier reaction after activation of security FOTO input or detector while closing</b> 00 – Barrier stops and returns to open position and continues according to parameter <b>05</b> 01 – Barrier stops and waits while the security input is operated, after security input is opened barrier finishes it's move 02 - Barrier stops and waits while the security input is operated, after security input is opened barrier finishes it's move with 2 second delay	00 - 02	00
10	<b>Motor overload detection – in case overload occurs during motor run</b> (violent stopping) 00 - Function switched off (motor runs for standard time) 01 – Function is active, time of motor run is set ( <b>01 – 20s</b> )	00 - 20	00
11	<b>Closing blocked using OPEN input</b> 00 - Function switched off 01 – In case the contact on OPEN input is operated it is not	00 - 01	00

	possible to close the barrier (used in gatehouses where it is necessary for the barrier to stay open while vehicle with trailer is passing), then it continues according to parameter <b>05</b>		
12	<b>Time of automatic closing extension</b> <b>01-10</b> Ratio with which time of automatic closing (parameter <b>06</b> – TIMER ) is multiplied	01 – 10	01
13	<b>Automatic closing and flash light pre-flashing time reset</b> <b>00</b> – Time is not reset <b>01</b> – Time starts to run after some opening input is activated	00 – 01	00
14	<b>Type of barrier setting for activation of unfinished movement report</b> (AGN 3.1 only) <b>01</b> - AGM1 <b>02</b> - AG500 <b>03</b> - AG900	01 - 03	01

### Recommended accessories example :

**Remote control receiver Rxd2pp** – 2-channel plug-in receiver with 10 pin Molex connector

### Rxd2pp receiver

Technical datas:

Power supply: 12-24 VAC/VDC

Frequency: 433,92 Mhz

Relay: 1A/30VDC

Working temperature: -20 - +60

Dimensions: 52x35x15 mm



1 and 2 channel board receiver with 10 pin Molex connector and settable function of output relays.

- radio self-learning function enables memorizing up to 83 different codes
- possibility of one code erasure and replacement with new one
- possibility of all codes erasure and replacement with new ones
- possibility to activate or deactivate ROLLING CODE mode
- possibility to connect portable programmer PROG2, which enables to programme outputs to 3 different functions – monostable, bistable and timer

## MONOSTABLE FUNCTION PROGRAMMING

Select desired channel referring to the table below:

Selected channel	Touch N° on SW1	LED L1	LED L2
Channel 1 monostable	1	*	
Channel 2 monostable	2		*

- Press N times receiver switch SW1 according to the table above: relevant LED lights up
- It is necessary to proceed with programming within 7 seconds
- Press the transmitters button until the receiver LED turns off for ½ second: this states that the code has been memorized
- LED immediately starts flashing for a number of times equal to the memory cell just occupied
- After the flashing finishes, the system is ready to be used

## BISTABLE AND TIMER FUNCTION PROGRAMMING

Using portable programmer PROG 2, it is possible to programme receiver outputs either as BISTABLE or TIMER

### ROLLING CODE MODE

It is possible to enable or disable the Rolling Code mode which makes impossible any attempt to duplicate receivers code. It is necessary to set J1 jumper on the board

- J1 open ..... rolling code mode enabled  
 J1 close.....rolling code mode disabled

WARNING: only with Rolling Code enabled transmitters code cannot be reproduced by others.

## PARTIAL DELETING FUNCTION

It is possible to delete one or more codes present inside the memory with the aim to disable desired transmitters. To enable partial deleting function proceed as below:

- Press SW1 on the receiver and keep it pressed until LED turns off
- Release switch: LED must start flashing (from 1 to 83) at a low rate (about one blink per second)
- Count LED number of flashes till the memory cell number desired to delete
- Press SW1 switch on the receiver during the desired flash count
- Release SW1 switch and wait a few seconds until LED goes off
- The selected memory cell is free now and ready to be memorized again

## TOTAL CLEARING

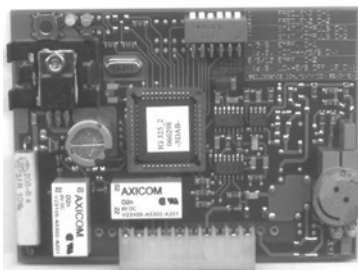
It is necessary to follow steps listed below:

- Disconnect receiver from power supply
- Press and hold SW1 switch on the receiver
- At the same time reconnect receiver to power supply
- Receiver LED flashes; release SW1 switch
- All the 83 memory cells are empty now and ready to be programmed again.

## ATTEMPT TO INSERT A CODE ALREADY PRESENT IN MEMORY

While trying to memorize a code that is already present inside memory, receiver LED makes a number of flashes equal to the memory cell number already occupied. To differentiate this function from normal programming mode, LED flashes at a higher rate and remains on for about 4 sec. during last blink.

## Inductive vehicle detector PLD1 – 1-channel board detector



In case the detector will be used as security device (eventually the barrier to be closed after vehicle leaves the loop – closing function), the detector board is to be plugged in right connector placed in right part of control unit.

The loop is connected to plug-in terminal board to clamps **LOOP**.

The function of detector is set up in means of settable parameter **01** of the main board (see the programmable function chart).

In case the detector will be used as opening one (after the vehicle enters the inductive loop barrier will be opened automatically), the detector is to be plugged in left connector placed in right part of control unit (intended for remote control receiver board). The loop is connected to plug-in terminal board to clamps **ANT+** and **ANT-**. For this function it is necessary to set programmable parameter 02 to value 00, no other setting is necessary.

It is possible to combine both detectors together (after entering the opening loop the barrier opens, after leaving the security loop barrier closes). In this case the distance between the loops shouldn't be more than 2 meters.

## Detector setting

### Dip switch 1,2

Working frequency setting. Two or more detectors should not work on the same frequency. In this case set different working frequencies on the detectors.

### Dip switch 3

Relay mode setting. It is possible to be set to impulse (100 ms) or static relay mode (operated for the whole time of presence of the vehicle on loop).

### Dip switch 4,5,6

Detector sensitivity setting, eventually activation or deactivation of relay, see the chart.

DIP4	DIP5	DIP6	Funkce
on	on	on	Highest sensitivity
on	on	off	
on	off	on	
on	off	off	Medium sensitivity
off	on	on	
off	on	off	
off	off	on	Lowest sensitivity
off	off	off	DIP3 off - open relays
off	off	off	DIP3 on - operated relays

**LED indication on detector board**

Detect - green LED – light on signalizes presence of vehicle on the loop

Error - red LED – signalizes any malfunction (short-circuit, loop damage). When green LED has long blinks – loop damage, short blinks – short-circuit on the loop

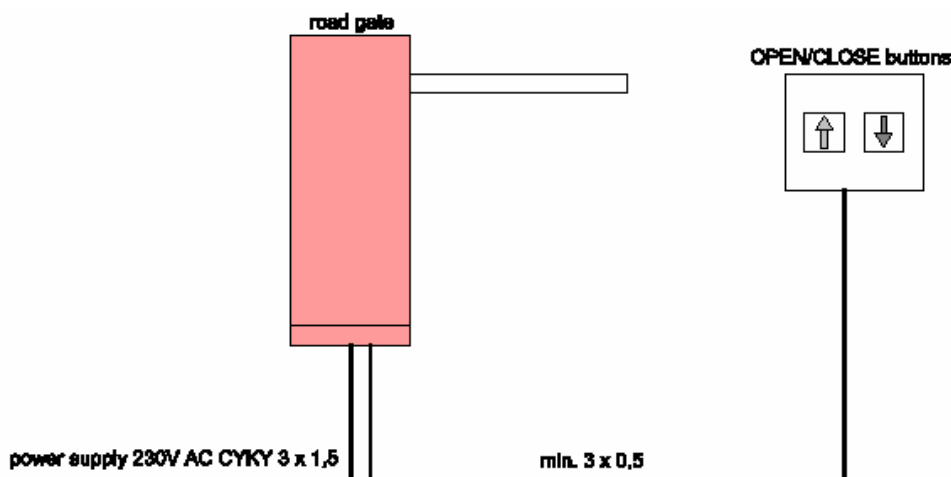
Power – yellow LED – blinks during initial tuning, in the moment it shines permanently the detector is ready to be used. In case detector tuning takes too much time (LED usually blinks a few times), retune the frequency by means of DIP-switch 1,2, or lower the detector sensitivity

**Reset button**

Serves to tune the detector. Use to change switches setting or when the detector doesn't work correctly. During the tuning process there must not be any vehicle on or near the loop, otherwise correct functioning of the detector cannot be guaranteed.

**Wiring diagram – buttons connection**

Barriers can be controlled in different ways. One of the easiest applications is control by „open/close button“ which is connected to the barrier by 3 x 0,5 mm<sup>2</sup> cable as shown in the following diagram.



Other possible ways of barrier control are:

- Radio remote control
- Inductive detector control
- Control by contact or contactless card access systems

### **Recommended accessories**

- ✓ Inductive detector
- ✓ Security photocell
- ✓ Security pressure ribbon
- ✓ Warning beacon
- ✓ Boom illumination
- ✓ Remote control
- ✓ STOP sign
- ✓ Skirts or double skirts
- ✓ Joint arm mechanism
- ✓ Stationary or swinging tip support
- ✓ Access systems

### **Device liquidation according to regulation 238 / 91 Sb.**

Barriers intended to be liquidated must be taken to parts and each component sorted out according to materials used (different metals, plastic).  
Sorted out components are to be placed in designated places.

## ES – Declaration of conformity

1) **Us**

AUTOGARD spol. s r.o.  
Dornych 47  
617 00 Brno - CZ  
IČ: 49446053

**hereby declare,**

that the following product on the basis of it's conception and construction corresponds to basic safety requirements of European regulations. Changing features of this product without the manufacturer's consent results in expiring of this declaration of conformity.

Name:	<b>Automatic barrier</b>
Type:	<b>AG500; AG900; AGM1</b>
Technical datas:	<b>230 V / 50 Hz 370 W/ 250 W/ 550 W</b>
Manufacturer, country of origin:	<b>AUTOGARD spol. s r.o., Dornych 47, 617 00 Brno - CZ</b>

Description and purpose of use: Automatic barrier is intended to regulate access of vehicles to dedicated areas.

Regulations:

Nařízení vlády č. 168/1997 Sb. v pl. znění (směrnice RE 93/68/EHS),

Nařízení vlády č. 169/1997 Sb. v pl. znění (směrnice RE 93/68/EHS),

Nařízení vlády č. 170/1997 Sb. v pl. znění (směrnice RE 98/37/EHS).

Technical norms and specifications:

ČSN EN 60204-1:2000 (EN 60204-1:1997), ČSN EN 61000-6-3:2002 (EN 61000-6-3:2001), ČSN EN 61000-6-1:2002 (EN 61000-6-1:2001), ČSN EN 292-1:2000 (EN 292-1:1991),

ČSN EN 292-2+A1:2000 (EN 292-2+A1:1995)

**This product is safe when used in regular way.**

**Manufacturer took steps to ensure conformity of all products brought to market with technical documentation and technical norms listed above.**

<sup>2)</sup> The declaration of conformity was realized in the cooperation with TÜV CZ s.r.o., Novodvorská 994, 142 21 Praha 4 – Czech Republic, IČ: 63987121 – Product certification authority.

Certificate number 361/06/07/02/0, was issued on 26.10. 2006 and is valid till 26.10. .2009.

Ing. Milan Plhák

Brno, 1. 11. 2006

.....

Date, place of issue

.....

Responsible person

.....

Signature

**Barrier Single test record according to ČSN EN 60204-1:**

<b>Type of test</b>	<b>Values requested</b>	<b>Conclusion</b>
Security connection test	$R < 0,1 \text{ ohm}$	Complied
Voltage test	$V = 2,5 \text{ kV}$ for the time of 1sec	Complied
Remanent voltage test		Complied
Functional tests	Setting, control	Complied

**Completeness and quality certificate**

The device is complete with full accessories and equipment, with no malfunctions and conforms to valid norms.

<b>Barrier type</b>	<b>AG/500</b>	<b>AG/900</b>	<b>AG/M1</b>
<b>Serial number</b>			
<b>Tested by</b>			

### Certificate of warranty

Product: Automatic barrier AG/500, AG/900, AGM1 + accessories supplied by AUTOGARD spol. s r.o.

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Manufacturer: AUTOGARD spol. s r.o., Dornych 47, 617 00 BRNO

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In Brno, date .....

Signature and stamp

### Warranty duration

Manufacturer, AUTOGARD spol. s r. o., is responsible for the construction, materials used, type of manufacture and functionality of supplied equipment for 24 months after delivery to the customer.

### Warranty conditions

The equipment has to be used in conditions and for the purpose it was designed for. Damages caused by attrition and misuses will not be considered as warranty. Also damages caused by third parties, coincidence, vis maior and inconvenient storage. Manufacturer's prior consent is necessary for any adjustments or alterations of the equipment.

### Warranty expiry

- a/ warranty time expiration
- b/ repair or adjustment of equipment or it's components besides authorized warranty service
- c/ connection to power supply which doesn't match the requirements of regulations and technical norms
- d/ use of non original components
- e/ payment after due date

Warranty to be claimed by the manufacturer. It is necessary to show certificate of warranty.

## Content

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